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THE ARCHAEOLOGICAL INVESTIGATION OF A FORT ANCIENT COMMUNITY NEAR OHIO BRUSH CREEK, ADAMS COUNTY, OHIO

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Abstract

In 1977, the Museum Department of Archaeology totally excavated the 64,000 m^2 Killen-Grimes site on the Brush Creek-Ohio River terraces in Adams County, Ohio. The major prehistoric occupation was represented by five rectangular houses and an egalitarian burial mound assigned to a thirteenth-century-A.D. late Brush Creek Fort Ancient phase. The site, which appears associated with the adjacent Wamsley site, represents the first information on such village-related Fort Ancient activities as well as offering an alternative model of Fort Ancient cultural development.

Introduction

The Killen Ridge sites, the Wamsley Village site, and the Grimes site lay on properties which were to be affected by the construction of the Dayton Power and Light Company's Robert Killen Electric Generating Station, near Wrightsville in Adams County, Ohio (Fig. 1). While the Wamsley Village site was preserved from adverse impact, the historic Stevenson homestead and the prehistoric occupations on Killen Ridge sites and the Grimes site could not be preserved (Fig. 2). Therefore, in the spring of 1977, data recovery was implemented by the Cleveland Museum of Natural History Archaeology Department with support from the Atlanta regional office of the Interagency Archaeological Services, Department of the Interior, Heritage Conservation and Recreation Service. The excavations and analyses were under the direction of David S. Brose (Brose et al. 1979). The field crew consisted of James Brennan, Michael DeSanti, Mark Doblekar, Jan Engebretsen, Mark Holan, David Morse, Lisa Murray, Franco Ruffini, and Shaune Skinner. Lithic source identification and aspects of the lithic analyses were under the direction of Fredrick Chapman. All phases of the field and laboratory supervision for the project were performed by Donald Bier, Jr.

Fort Ancient occupations identified in the initial survey (Otto 1976) were located on the second and third alluvial terraces of the Ohio River, downstream from the mouth of Ohio Brush Creek. The earliest historical accounts of this area relate that in the late eighteenth century it was a favorite location from which belligerent aborigines would lure unwary American sojourners to their doom. Their spirit lives (Brose 1971a).

It was thought that the excavations at the Killen area would reveal evidence for a protohistoric village area between the Scioto and Miami Rivers along the Ohio (Brose 1976a). While this was not the ultimate result, perhaps a significant contribution has been made. Data concerning processes of cultural change which lead to those regional protohistoric occupations have been revealed, and the Killen-Grimes-Wamsley investigations reported (Brose et al. 1979:1–520) have shed light on a region which was as much archaeological terra incognita for the thirteenth century A.D. as it was to be historically for the seventeenth century.

Environment

The Killen site is located on the Ohio River terraces in south-central Adams County, Ohio, at the juncture of the Appalachian Plateau and the

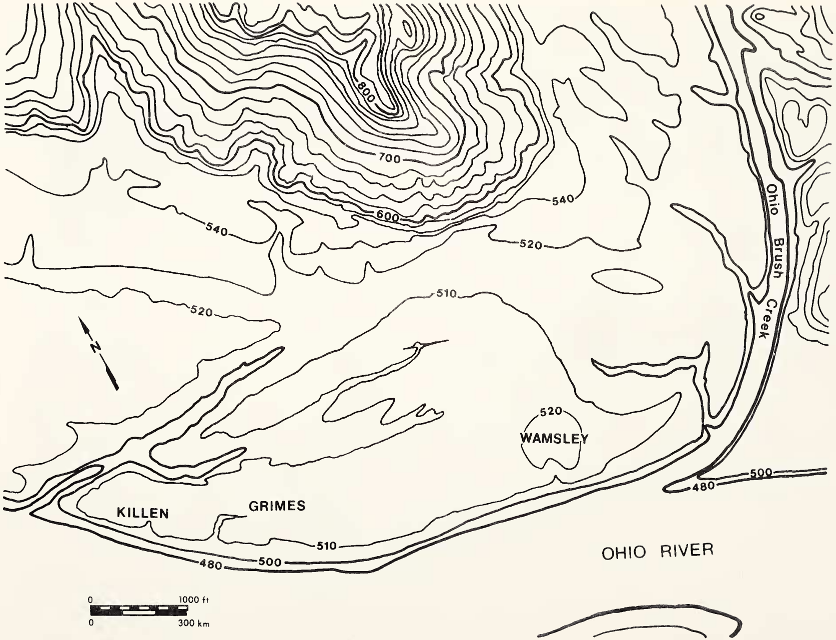


Fig. 1. Map of Killen-Grimes area near Ohio Brush Creek.

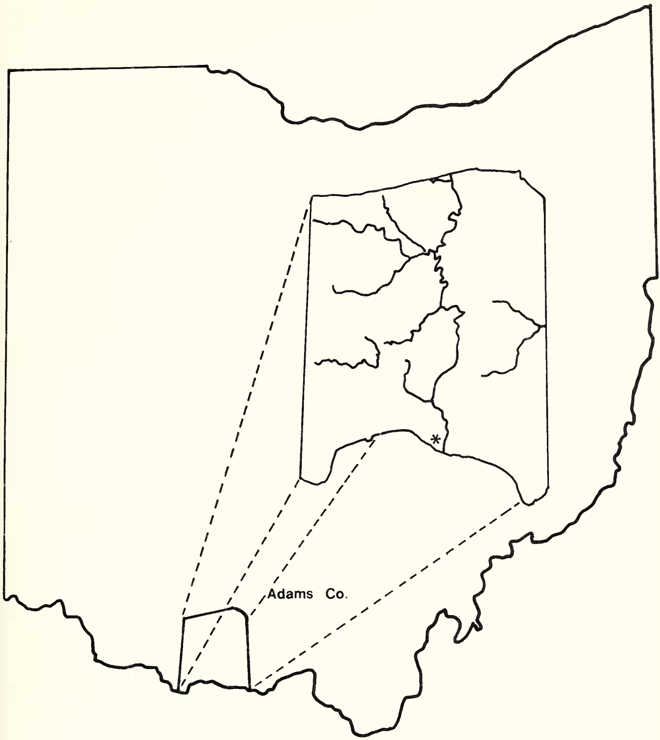


Fig. 2. Map of Adams County, Ohio.

Central Lowland Province. The northwestern portions of Adams County are glacial till plains; the eastern third of the county is a rugged portion of the unglaciated Allegheny Plateau, while the majority of the county west of Ohio Brush Creek has been termed the Lexington Plain. Ohio Brush Creek represents a tributary of the Ohio River within the eastern margins of the unglaciated plateau, most of whose drainage system lies outside of that zone (Fig. 2). These topographic differences, along with the variations in

underlying bedrock and in drainage systems, created conditions of maximum diversity: there is more topographic variation within Adams County than anywhere else in the state of Ohio (see Brose et al. 1979:1–37).

In most respects, the ecological situation found at the Killen site was relatively rich for aboriginal human exploitation with a primitive technological base. The conjunction of several topographic and floral zones provided a wide variety of naturally available subsistence resources, although seasonal availability and imperfect storage technology must have created annual shortages. Riparian faunal resources would have been easily available and would have yielded significant amounts of protein for both prehistoric and historic occupants of the site. The proximity to outcrops of several varieties of chert (albeit of minimal quality) and the presence of higher quality materials in alluvial gravels would have provided a nearby source for most raw materials utilized in tool manufacture. Finally, although poorly drained, the soil associations in the vicinity of the Killen site are among the most agriculturally productive in the state, and the length of the growing season within the Ohio River valley is exceeded within Ohio only by the Lake Erie islands (Plate 1).

There is a relatively dense Fort Ancient occupation of southern Adams County centered on the floodplains of the Ohio River/Ohio Brush Creek

Plate 1. The Killen-Grimes site area looking south to the Ohio River and the Kentucky hills.

confluence. These floodplains have received closer inspection than the rugged uplands. Other than the Fox Farm site itself (Smith 1911), no Fort Ancient occupation is reported in Mason County, Kentucky, across the river, although Schwartz had reported that Fort Ancient village materials were exposed at the Mehldall Lock construction site 20 km below Maysville. The ceramics recovered from most of these sites represent a blend of Fort Ancient types characteristic of Brush Creek, Fox Farm, and Feurt components: all *could* be placed within Griffin's (1943) Madisonville focus, although typical Madisonville ceramics are absent. Griffin (1978) noted that the 1943 Madisonville focus is too gross and that "sufficient differences between sites in the western and eastern ends of the continuum along the Ohio River will eventually be recognized and these will establish a Madisonville phase on the west and a Clover phase on the east."

Essenpreis (1978) argued that differences between Clover and Madisonville sites may be structural and functional in nature within a single Madisonville phase which spans the Ohio River from at least the Muskingum to the Miami Rivers. These differing perspectives follow from the relatively differing conceptions of the cultural processes involved in the formation of the Fort Ancient culture itself (Brose 1976a; Brose et al. 1979:37–86).

Excavations, Features, and Structures

During the initial excavations of the 46 systematically located 1 x 1 m units at the Grimes and Killen tracts, it became apparent that there were few areas of continuous cultural deposits and that agriculture had truncated those deposits which did exist (see Brose et al. 1979:86–117). The only technique considered likely to yield adequate information on extant archaeological material distributions was to remove the plow-disturbed soils by mechanical stripping in order to discover subsurface features or deposits. The Grimes portion of the ridge comprised over 22,000 m^2; the Killen portion comprised over 13,000 m^2 (exclusive of the mound and previously encountered northern sheet midden). Therefore, a continuation of subsurface random sampling, while yielding some distributional data, would not yield representative samples of aboriginal features or reveal sufficient patterning for adequate reconstruction of the occupational pattern. Therefore, first on Grimes, then on Killen, transects were stripped by road grader of plow-disturbed overburden in an east-west direction. Hand-shovel skimming of these strips was followed by recording baulk profiles. Next, transects were machine stripped in a north-south direction, shovel

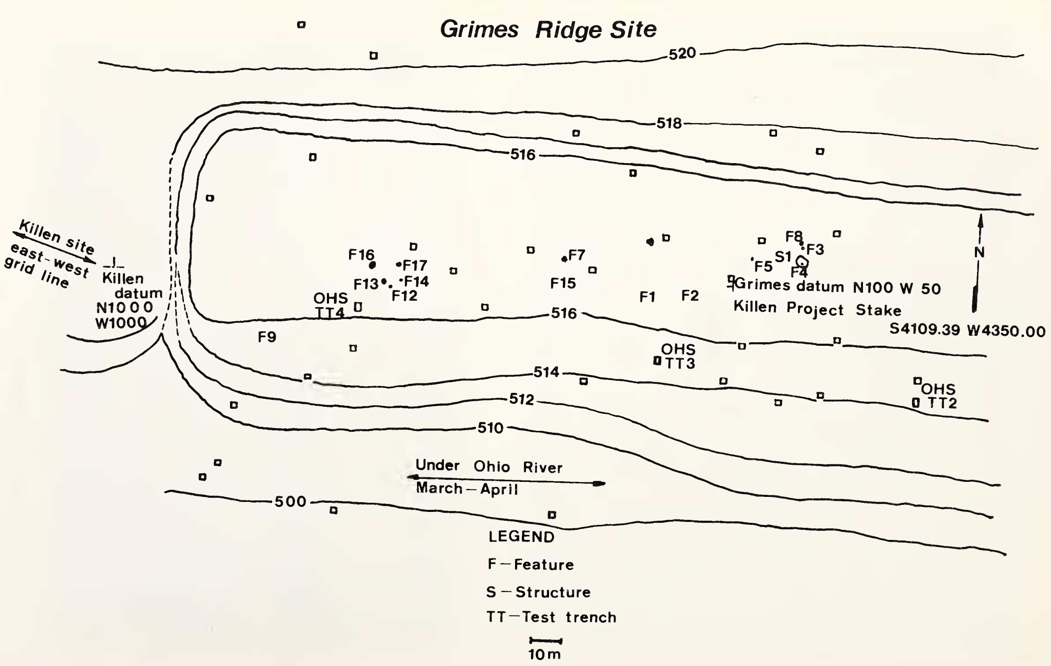


Fig. 3. Map of features and structures on Grimes tract.

skimmed, and profiles were recorded. A 20% sample of the remaining unstripped squares was tested by hand excavation, and finally the entire site area was stripped. The Grimes recovery revealed 17 aboriginal storage and/or cooking features and 1 aboriginal structure (Fig. 3). On the Killen ridge area these methods revealed a large sheet midden (Plate 2) with several burials, a burial mound, 14 aboriginal storage and cooking features, and 5 aboriginal structures (Fig. 4) (Brose et al. 1979:117–191). One feature at Grimes (Fig. 5) and two features at Killen were isolated wattle-and-daub walls, unassociated with other structural features. Several structure-free areas of intensive and localized burning occurred at both Grimes and Killen. These features had low artifact/ecofact yields, as did several small, shallow, unfired refuse pits, most of which did not yield much refuse in spite of neutral soil conditions and intensive flotation.

Several morphological subclasses of these refuse pits could be defined. Most pits were empty (Plate 3) and associated with structures, and at Killen these were located on areas proximal but external to structural walls. Such pits may be an ethnographic analog of temporary Iroquois caches of personal property.

Relatively shallow unprepared pits filled with fire-cracked rock appeared as the central feature within Grimes structure 1, which morphologi-

Plate 2. Archaeological recovery of flexed burial in Killen midden.

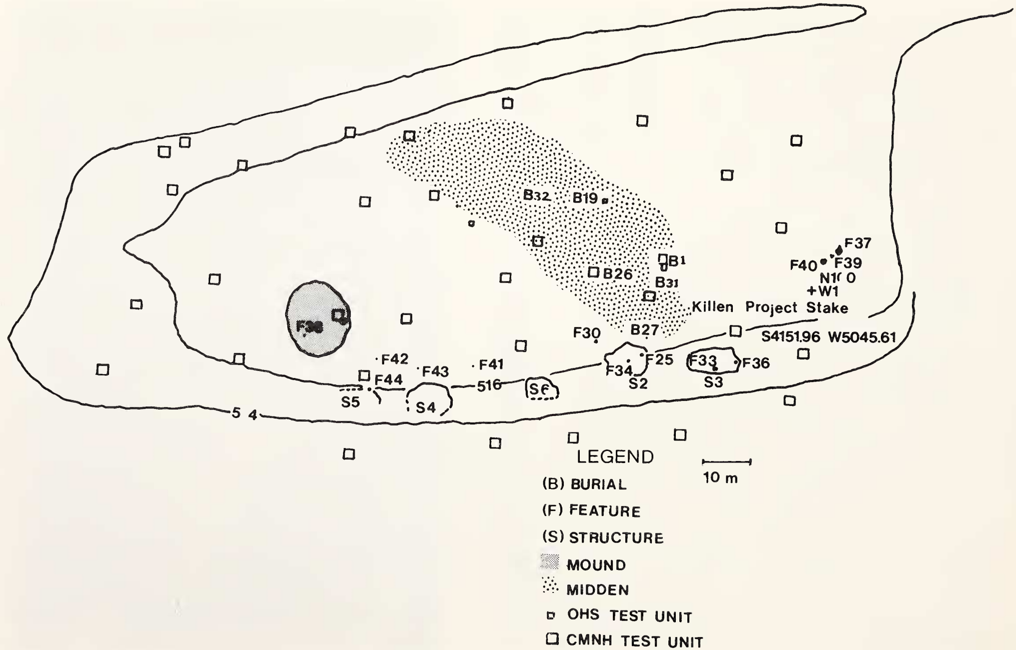


Fig. 4. Map of features and structures on Killen tract.

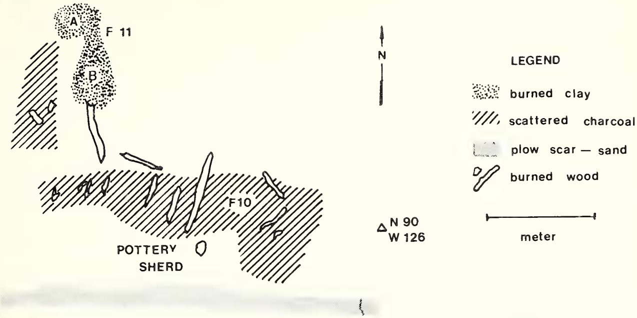


Fig. 5. Plan of Grimes features 10/11: an isolated wattle-and-daub wall burned in place.

cally and radiometrically was determined to be a Middle Woodland occupation (Brose et al. 1979:234–235, 362). Such rock-filled pits also were found as extramural features both at Grimes and at Killen. Deeper, basin-shaped, puddled-clay hearths without fire-cracked rock occurred within several of the Killen structures. These differences may reflect significant functional differences as well as the more obvious chronological differences. Unfortunately, only limited floral and faunal material could be

Plate 3. Typical empty storage pit associated with Killen structures.

recovered from these hearths (Ford 1979:514–520), and their analyses provided no resolution to this problem.

At most of the structural areas at the Killen portions of the site, fragments of burned ceramic daub were recovered, as were found at a few of the isolated walls. Typical construction methods appear to have involved setting individual posts (13 cm in diameter) vertically into the ground, to depths varying between 15 and 25 cm, at approximate 30 cm intervals (Figs. 6–9; Plate 4). A lighter horizontal framework of wattle would be woven or tied into place, and the entire structure plastered with clay, at least on the exterior. At least one such wall, that of structure 5, burned in place (Plate 5). Presumably, some waterproof roofing would have had sufficiently overhanging eaves to protect the structural walls, although no drip line was archaeologically encountered. Postholes were dug by hand, or with such ad hoc tools as clam shells or split mammal bone prior to placing the posts. Several of the larger post molds yielded such materials as well as fragments of lithic debitage and ceramics incorporated into the aboriginal backfilling of the postholes (Brose et al. 1979:139–166).

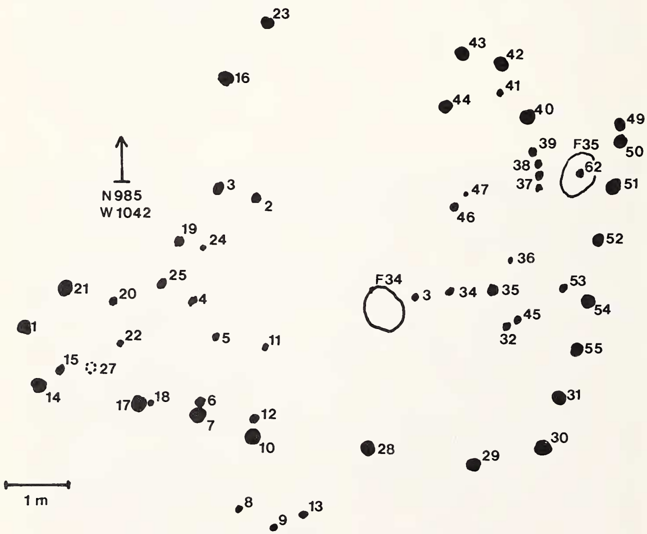


Fig. 6. Floor plan of Killen structure 2.

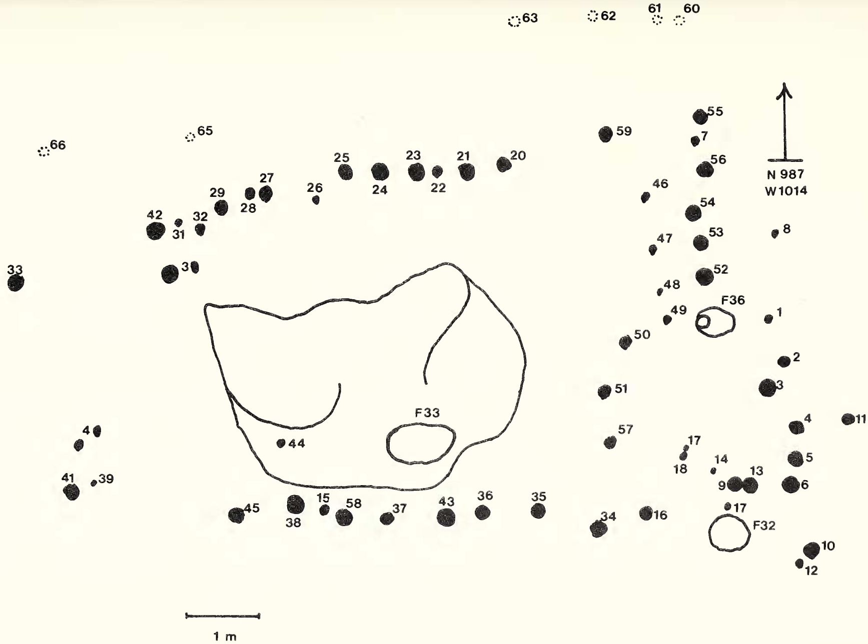


Fig. 7. Floor plan of Killen structure 3.

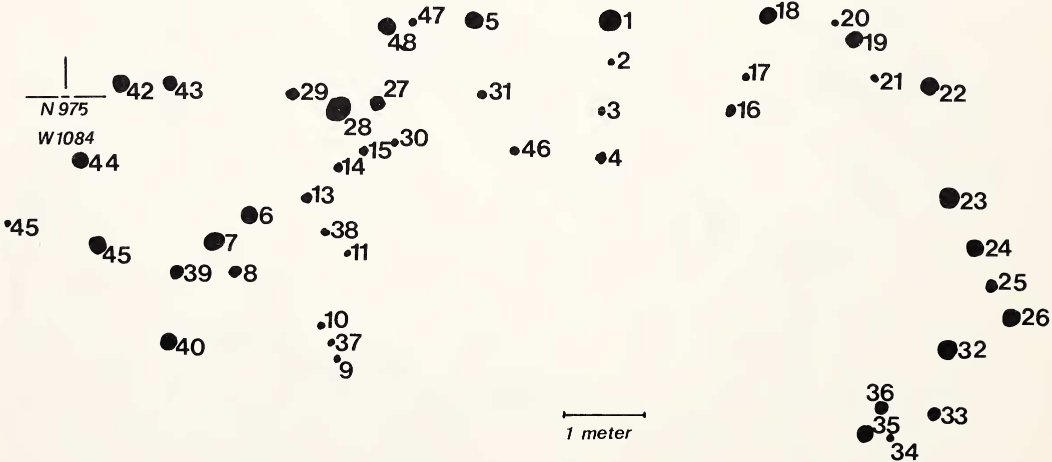


Fig. 8. Floor plan of Killen structure 4.

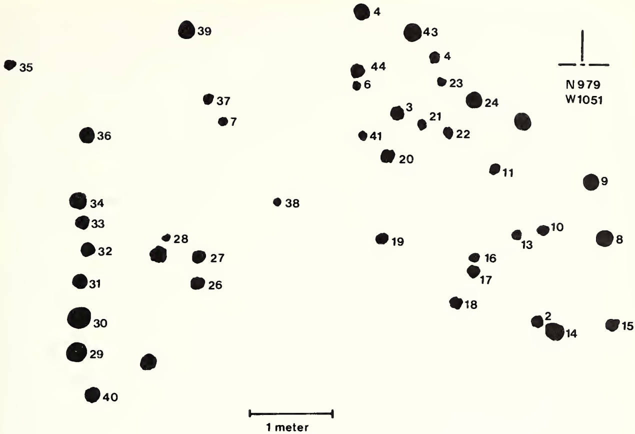


Fig. 9. Floor plan of Killen structure 6.

For at least two of the Killen structures, episodic rebuilding of walls took place. There was no evidence of post-for-post replacement, but, given the interlocking nature of wattle-and-daub construction, it may not have been much more difficult to replace an entire wall than to tear it apart to replace a single post. The life expectancy of the various structural hardwoods recovered would be less than 10 years, especially given the fact that the bases of deeper postholes were within a nearly impervious clay acting as sumps. That only two of the five Killen structures required only one wall rebuilding each suggests a limited time for family expansion or for foundation decay—no more than a single generation—if all of the structures were coeval. Indeed, the Killen structures all had similar construction. They were subrectangular with rounded corners, an off-center fire hearth, and a floor area around 52 m^2 (540 ft^2). Population estimation from floor area is culture-dependent (see Brose 1971), and there is no acceptable ethnohistoric affiliation for most of the Ohio Valley prehistoric groups (see Griffin 1978). It is nonetheless quite probable that proto–Central Algonkian groups occupied the region aboriginally, and generalized Algonkian proxemics (Brose et al. 1979:161–166) suggest between 28.0 and 35.4 ft^2 of floor space per occupant in northern areas and between 30.8 and 55 ft^2 of floor space per occupant in southern areas. The mean is 37.2 ft^2 per occupant,

Plate 4. Excavated postholes of Killen structure 3.

yielding the astounding estimate of 14.2 occupants per structure. If pits and hearth areas are removed from interior areas, the mean area for the Killen structures is 47.6 m^2, or 512 ft^2, which results in estimates of 13.7 occupants per structure. As Faulkner (1977) noted, rectangular structures (summer houses) averaged 10% to 20% greater floor areas than winter "hot" wigwams. Thus, the Killen structures may have had between 10 and 12 occupants each. Where such data exist, the short axis of all structures appears oriented WNW-ESE, perpendicular to the prevailing winds which come up the Ohio River valley. At all structures, evidence for extramural activity lies leeward.

A number of similar structures have been excavated at the coeval Incinerator site along the Miami River in Montgomery County, Ohio, where the clustering of ceramic motifs and burial areas suggests family-unit occupation (Heilman 1975, personal communication). The Blain Village site on the Scioto River in Ross County, Ohio, yielded some evidence for possible

subrectanguloid, rounded-cornered, single-post houses estimated to be about 5.5 x 7.0 m, or about 450 ft^2, in area (Prufer and Shane 1970). The possible Blain structures and the Killen structures, unlike the Incinerator site structures, could all fit Mills's loose definition of Baum and Gartner "teepee rings" (Mills 1904, 1906). Other Fort Ancient structures reported from elsewhere in the Ohio Valley are more linear, larger, and later (Hanson 1966, 1975; Graybill 1980).

Killen Burial Mound

Test excavation into the central portion of the low rise on the western end of the Killen tract immediately yielded the first of 35 burials (Brose et al. 1979:167–190; Astramecki and Mensforth 1979:403–467) (Fig. 10). The extent and structure of what was thus revealed to be an artificial mound was determined by a series of 27 subsequent hand-excavated 1.5 m wide x 1 m long units, resulting in two trenches intersecting at right angles. Due to plowing of the mound's superstructure, it was not possible to determine the

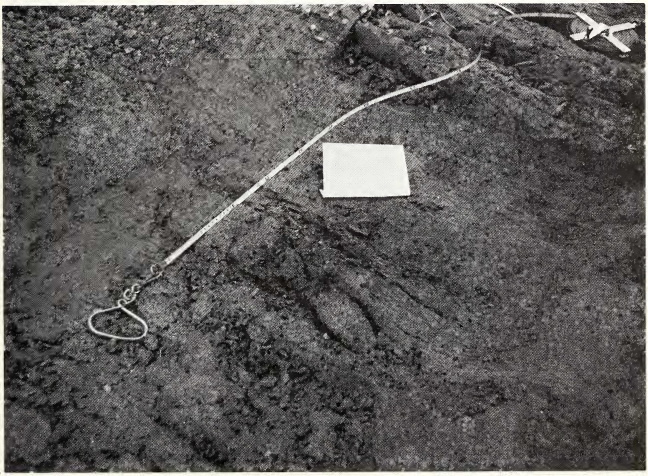


Plate 5. Burned wall section of Killen structure 5 exposed in troweling.

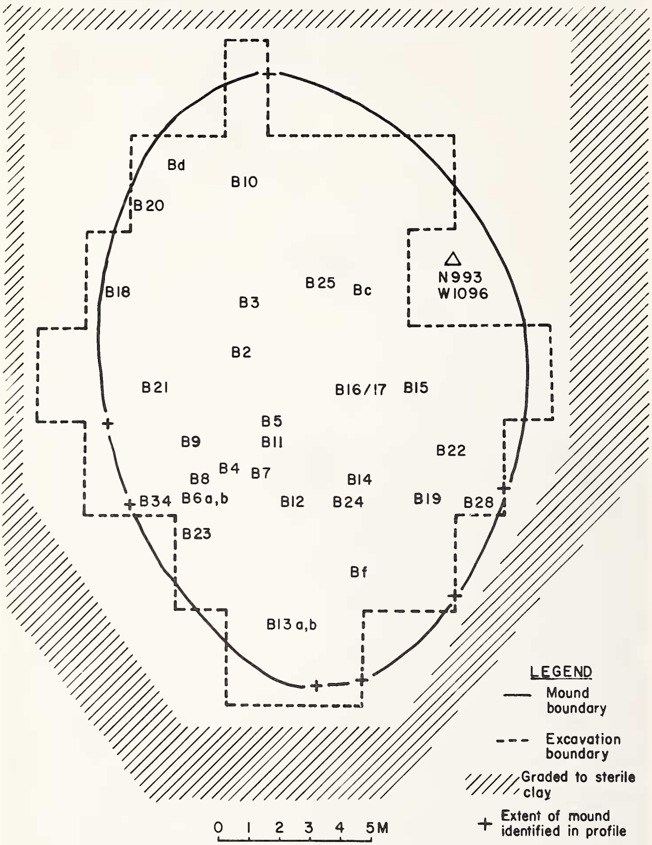


Fig. 10. Schematic plan of the Killen burial mound.

lateral extent of the mound by other means: relief approached only 27 cm. Stratigraphic profiles within the excavation units revealed that the mound construction had begun by excavation of an oval basin 16 x 12 m to 50 cm below ground surface. Within this basin, a fine sandy silt platform between 25 and 50 cm high had been placed. Burials were then placed on top of this platform or in pits which were excavated into the platform and in some cases carried down to the underlying clays (Plates 6, 7). It was possible to discern a basket-loaded structure within undisturbed sections of this platform. In several profile segments, it was also possible to discern basket-loaded structures in the subplowzone sediments which overlay some superimposed platform burials.

The remainder of the mound, excavated by hand, consisted of a plowzone, mound fill, and lensed midden deposits to the east and west margins, with the entire mound resting on the underlying clays. Several dental

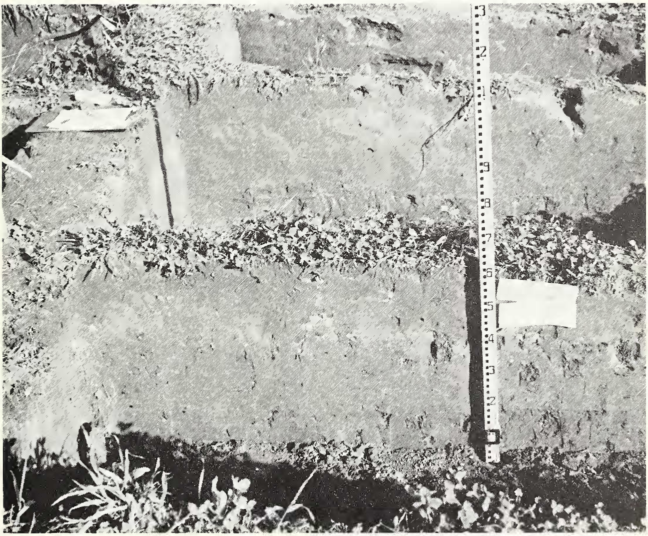


Plate 6. Stratigraphic profile through edge of Killen burial mound.

Plate 7. Stratigraphic profile through central portion of Killen burial mound.

crowns were found at the transition from the plowzone to the mound fill itself, in the undisturbed furrow crests between plow scars. The fill of the mound was 25–40 cm thick at mound center, and it tapered at the edges. Of the 35 aboriginal individual interments associated with the Killen Burial Mound, nearly all of which were postpuberty, specific five- or ten-year ranges for estimated age at death were available only for 15 interments. Reliable sexual distinctions were possible only for 9 individuals. Both age and sex determinations were available only for 7 individuals.

The subsurface platform, built up in the oval depression to slightly above the original ground surface, had cut into the southwestern edge of the homogeneous Killen midden (Fig. 11). Along the northwestern margin of the mound platform, the stratigraphic profiles revealed that some sub-plowzone deposits of the midden overlay the segments of the subsurface mound platform. These data appear to conclusively demonstrate the accumulation of the midden both antedating and postdating the use of the subsurface mound platform for burial. Although no chronological sequence can be determined for those burials simply placed on the surface of

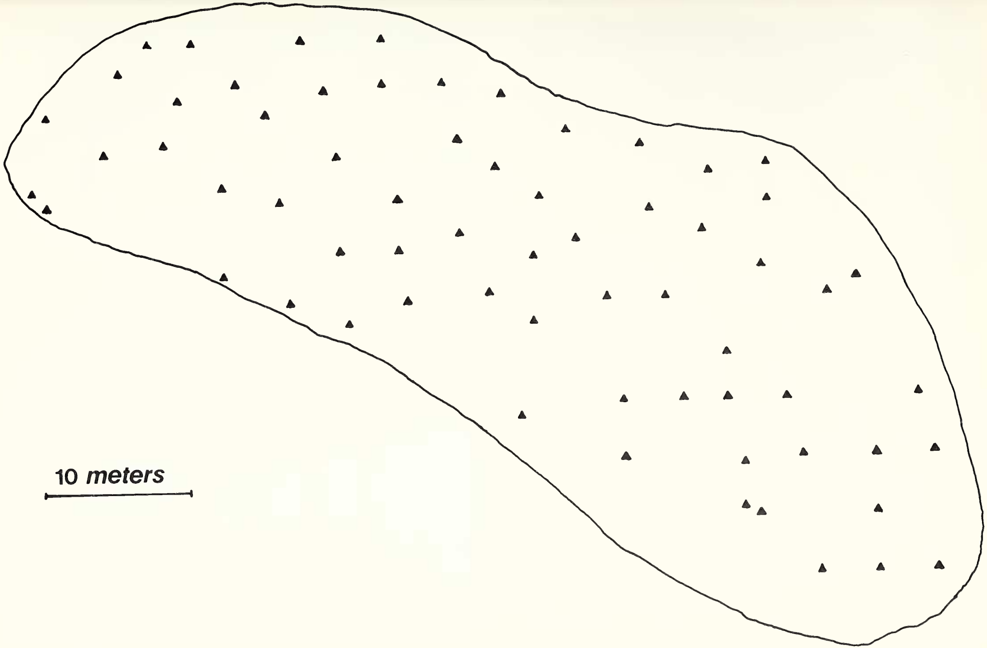


Fig. 11. Diagram of hand-excavated 1 x 0.5 m test units in Killen midden.

this platform or for those interred in isolated subplatform pits, the surface-platform Burials 6a and 6b partially overlay the subplatform pit of Burial 23, and that pit, in turn, appeared to have been cut into by the subplatform pit of Burial 9 (Plate 8).

Given the mound platform crowning and the visible mound surface, it was possible to define three zones of mound burials for the 26 in situ individuals: a clustered central group, a uniformly distributed intermediate group, and a randomly placed peripheral group. Most of the central-zone burials were placed on the platform surface, while most of the subplatform-pit burials and burials in the mound fill were located in the two more distal zones. The variables of mound zone, age, sex, orientation, posture, grave type, grave goods, and spacing show no significant intercorrelations (Brose et al. 1979:182–188). Of 3272 potential mortuary variable state combinations, the 26 in situ individuals represent 18 mutually exclusive combinations, and even these co-occurrences may be due primarily to missing data. I believe that this does not reflect any hierarchical or complex social organization. Rather, at the Killen site, whatever differential social status which may have existed in life was simply not reflected in the mortuary program. While it may be unusual, ethnographically, to discover status-differen-

Plate 8. Killen midden burial No. 9 showing degree of preservation in deep submound platform pits.

tiated societies which do not show differential burial modes, the argument that variable burial modes imply a status-differentiated society does not logically follow. It is not easy to measure the value of differing "social energy" expenses which the society itself recognized (cf. Saxe 1970). As Greber (1976) has shown, the energy-free variable of proximal vacant floor space is a major reflection of an individual's social status for some of the Hopewell groups within southern Ohio.

If any individual may be taken to represent elite status within the Killen mound, it may be Burial 14—a young male whose grave had a limestone slab and border. While all of the burials with grave goods were found on the platform surface, grave goods per se do not suggest elite status.

The most generous estimates, extrapolated to unexcavated areas, suggest that the total mound population could have only been around 40 individuals (Brose et al. 1979:185–188). If the known demography of those individuals recovered is representative, then it is safe to say that children and infants did not receive mound burial. This suggests either that ascribed status was not significant, or that such status was not ascribed to an individual until after puberty or adolescence. A large proportion of aboriginal mortality should be expected in the 0–9 and 15–19 age classes (Weiss 1973). Neither of these are represented at the Killen mound (Astramecki and Mensforth 1979:403–467). Interpolation based on missing age classes suggests that the estimated 40 mound and 6 known midden burials may have represented only 60% of the normal population mortality. This in turn implies a total expected mortuary population of approximately 67 individuals, many of which should be children. Those 30 young individuals not found at Killen yet may be found within the floors of structures at the nearby Wamsley Village site (see Brose et al. 1979:181–190).

The Killen structures themselves are seen to represent no more than an occupation of two generations' duration. Use of the mound, clearly sandwiched within the period of structure-related midden accumulation, is thus similarly limited. With the 17-year estimate for the generation, a "normalized" mortality rate of 10.5/1000/year could have produced 77 burials from a total population of 419. Such a population is far higher than what the most generous population estimates would have occupying the Killen Ridge structures alone. From recent subsurface testing and from surface collection over the past decade, the Wamsley Village appears to be similar in size and general structure to the Incinerator site excavated by Heilman (1975). That site was estimated to have had a population of 250–400 individuals. By itself, the Wamsley site would not have yielded the requisite number of adult burials found at Killen, unless higher rates of mortality

were postulated (13.2/1000/year) or utilization of the Killen Burial Mound extended for more than 17.5 years. The reasonable conclusion would seem to be that Killen structures 2–6 represent an occupational locus of the Wamsley Village population (Heilman 1975).

Ceramics

The 1977 excavations at Killen-Grimes-Wamsley yielded 2105 sherds (9265.8 g). Of these, 90 were rimsherds, and 86 were decorated bodysherds or handles. In analyses of horizontal distributions, there was a separation of sherds recovered from potentially disturbed or surface contexts from ceramics recovered within their original levels of deposition. With the exception of seven Middle Woodland sherds from Grimes, the ceramics appear to represent a relatively homogeneous assemblage which can easily be categorized as Fort Ancient, although the exact placement within that category is no easy decision. The distribution of ceramics by surface finish and tempering material is presented in Table 1 for the Grimes and Killen areas.

Insofar as possible, rimsherds and bodysherds were fitted to form a minimum number of vessels for typological analysis. Similar rimsherds and bodysherds were tested against these reconstructed vessels to determine whether they could be considered to represent a separate vessel (only if two or more technological attributes differed [e.g., estimated vessel capacity, temper, surface treatment, rim profile]). This proved to be a difficult procedure; therefore, some caution must be exercised in presenting the comparative results. The pottery from Killen-Grimes (and, to a large extent, the bulk of aboriginal pottery from the Wamsley Village site as well) represents a rather undistinguished Fort Ancient ceramic assemblage. Ves-

TABLE 1
Relative Frequency of Surface/Temper Complete Sherds from Fort Ancient Contexts Only

	Killen Ridge	*Grimes*	*Total*
Shell-tempered Corded	44%	15%	59%
Shell-tempered Plain	32%	14%	46%
Grit/Mixed-tempered Corded	11%	41%	52%
Grit/Mixed-tempered Plain	13%	30%	43%
Total	100%	100%	200%

Chi Square = 49.23; d.f. = 3; $p < .001$

sel surfaces ranged from clearly cordmarked to completely plain, but sufficient ceramics showed the partial smoothing of cordmarked surfaces in most areas of the vessel (except for the basal portions) to suggest that the degree of roughened or smoothed surface was not a major concern of the aboriginal potter. Vessels displaying similar temper, rim profile, lip treatment, decorative motif and technique, and surface finish were considered to represent a single type.

Practically every ceramic vessel from this component has counterparts illustrated under a number of names. In most cases (e.g., Griffin 1943; Hanson 1966, 1975; Prufer and Shane 1970; Gartley et al. 1973, 1975; Murphy 1975; Johnson 1978), the taxonomic criteria have been loosely applied, have been rarely made explicit, and (where illustrations exist) suggest that the same ceramics can often be found under different taxa or that within a single taxon considerable difference in ceramic attribute combination is common. In attempting analysis of extant Fort Ancient ceramic typology, it became apparent that the discriminating ceramic attributes represented differing levels of taxonomic significance in Griffin's more than adequate typology (Griffin 1943). No subsequent student of Fort Ancient ceramics has had the temerity to redefine these types, being content rather to pigeonhole those new data which Griffin did not have within preexisting categories. For example, for shell-tempered ceramics, the distinct surface treatment of fabric impressing *by itself* defines the type Fox Farm Salt Pan regardless of any other ceramic attribute. The simple-stamped (or grooved paddle-stamped) surface treatment on ceramics without an added rimstrip is sufficient for assignment to the type Madisonville Grooved Paddle Stamped, while the added rimstrip is sufficient to define the type Wellsburg Simple Stamped (Mayer-Oakes 1955). Types such as Anderson Cordmarked and Incised were defined by a particular rim treatment regardless of surface treatment or temper, or of motif of rim decoration. There is considerable ambiguity as to whether this represents two types or one (Griffin 1943:344). Types such as Madisonville Cordmarked and Fox Farm Cordmarked appear to have been distinguished in 1943 solely by the shape of the strap handles, while Feurt Incised represented a modal association of attributes of tempering, surface, technique and motif of decoration, and handle shape; thus, it was never clear where Feurt Incised graded into the other types described. Had the sorting criteria for the Madisonville-Feurt-Fox Farm ceramics been consistently applied to the Baum focus sites, it is likely that the type (or types) Baum Cordmarked and Incised would be represented by five or six types at the same taxonomic level as Fox Farm Bowl (Griffin 1943:345) or Philo Punctate (Gartley et al. 1975).

Fortunately, the ceramic sample from the Killen-Grimes-Wamsley

excavations is too small to justify any grandiose attempt to systematically redefine the Fort Ancient ceramic series. Yet as Griffin (1978) has stated, such reanalyses are certainly necessary if archaeologists are to use the resultant ceramic types to argue for direct Adena precursors (e.g., Rafferty 1975) or upstream invasion (e.g., Prufer and Shane 1970; Dunnell 1972). In Griffin's original studies of Fort Ancient ceramics, a variety of ceramic decoration was under analysis. Minor variations within type or variety were of little moment as the primary objective had been to compare a number of types from one site with those similar types described at other sites. The ceramic assemblage from Killen-Grimes-Wamsley is of limited size and variation, and one aim of the analysis has been to compare differences in ceramic attributes between site areas. The range of ceramic variation of this small sample of 52 minimal vessels (from about 2100 sherds) is so restricted that, with the exception of the previously noted sand-tempered ceramics from Grimes, all of the ceramics could fit within what Griffin (1943:62–63) described as Baum Cordmarked pottery from the Brush Creek component. Alternatively, these same ceramics could be assigned to such distinct types as Baum Cordmarked and Incised, Fox Farm Cordmarked, Madisonville Plain, Madisonville Cordmarked, Feurt Incised, and Baum Shell-tempered var. Blain, although in every case such type assignment must be loose, and vessels will have the disconcerting ability to slide from type to type. No strong correlations of vessel shape (Fig. 12), surface decoration, or paste existed. The few decorated ceramic fragments and handles represent so small a sample that no statistical significance can be given to the apparent association of shell tempering or to the predominance of smoothed surfaces with these attributes. The ceramics from ambiguous contexts will be ignored.

Given their variability, it might be said that the Killen-Grimes-Wamsley ceramics represent three distinct ceramic wares, as used by Griffin (1952:101, 114–116, 121), due to the differences in paste and in tempering materials. While such a distinction is warranted for the seven compact, sand-tempered, stamped sherds from Grimes, the intergradation of paste and temper, the random associations these attributes show with any and all other ceramic attributes, and the fact that even Griffin (1943) has included all of these variations within a single type strongly argue that ware distinction based on paste or temper within the bulk of the Fort Ancient pottery may be meaningless.

All of the Killen-Grimes-Wamsley ceramics seem to have been constructed of similar slightly sandy clays. Surface deposits of similar sandy clays underlie the western portions of the Killen Ridge itself and are nearly

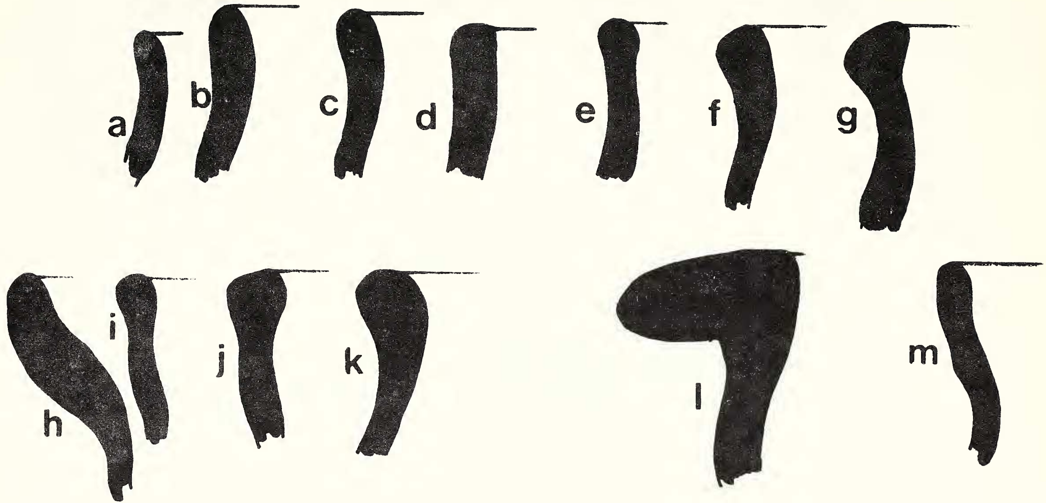


Fig. 12. Rim profiles of Fort Ancient ceramics recovered from Killen-Grimes-Wamsley excavations: exterior to left.

ubiquitous along the lowest banks of the Ohio River. Measurements for hardness were taken on a random 25% sample of all sherds larger than 2 cm in diameter. Scratch tests were made on the edges of breaks, rather than on eroded exterior and interior surfaces. All measurements indicated a Moh's hardness scale value between 2.0 and 3.5, with all but a handful between 2.0 and 2.5. Little variation within a single sherd was observed, and no correlation with temper could be demonstrated. Paste texture could be classified as grading from laminar to compact, but eroded surfaces of all sherds, save the sand-tempered "Grimes Seven," were friable. There did not appear to be any significant differences between rim and bodysherds.

Nineteen shell-tempered vessels displayed a Madisonville Cordmarked incised curvilinear guilloche (Plate 9a, c, d, o). Seven shell-tempered vessels displayed the darker paste and finer cordmarking characteristic of Fox Farm Cordmarked (Plate 9g, h), but these could equally well have been classified as more carefully executed sections of vessels, other portions of which could be considered with the plain Madisonville Cordmarked jars. However, it should be noted that that the handle and rim profiles and the overall morphology of the vessels from Killen-Grimes-Wamsley are far more Baum-like than they are Madisonville-like. Five cordmarked, mixed shell- and grit-tempered vessels from the Grimes tract (Plate 9b, e, f, n) could easily have been considered Baum Cordmarked, virturally identical to those ceramics Griffin (1943) described from the Brush Creek component. The cordmarked, grit-tempered vessels from Grimes (Plate 10c, d, m) could also be considered as the Brush Creek variant of Baum Cordmarked. Hanson (1966) wanted to refer such ceramics at the Hardin site to Mayer-Oakes's Watson Cordmarked when they occurred in a Fort Ancient site on the south bank of the Ohio River. If this approach were accepted, the north-bank equivalent should be Peters Cordmarked (see Prufer and McKenzie 1967). Further, Hanson's designation of plain grit-tempered ceramics as Scarem Plain (after Mayer-Oakes) could be followed by referring to the plain grit-tempered ceramics from Grimes as Peters Plain (after Prufer and McKenzie). Although I do not choose to do so, the mere existence of this classification option says something about Woodland / Mississippian continuities. In general, I have argued that the mixed shell- and grit-tempered ceramics from Grimes-Killen-Wamsley could be best considered to represent a Brush Creek variant of Baum Cordmarked (not all of which was) or a variant of Madisonville Cordmarked (although they lack the diagnostic handles). Most of the Killen ceramics which were plain shell-tempered or shell- and grit-tempered jars, although lacking the characteristic handles, might best be described as a Brush Creek variant of Madison-

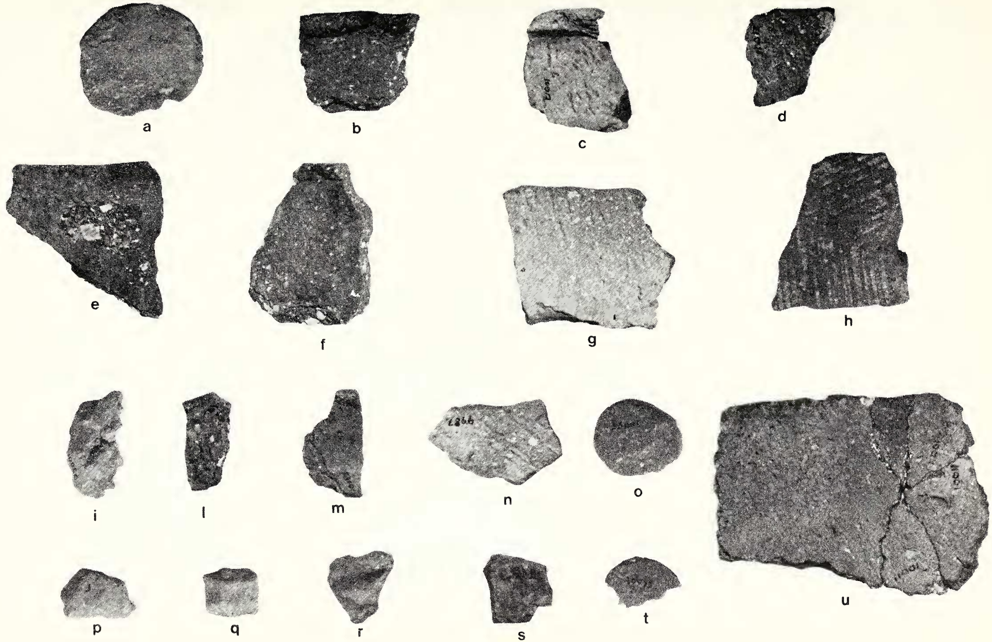


Plate 9. Various ceramics from Killen-Grimes-Wamsley; see text for descriptions.

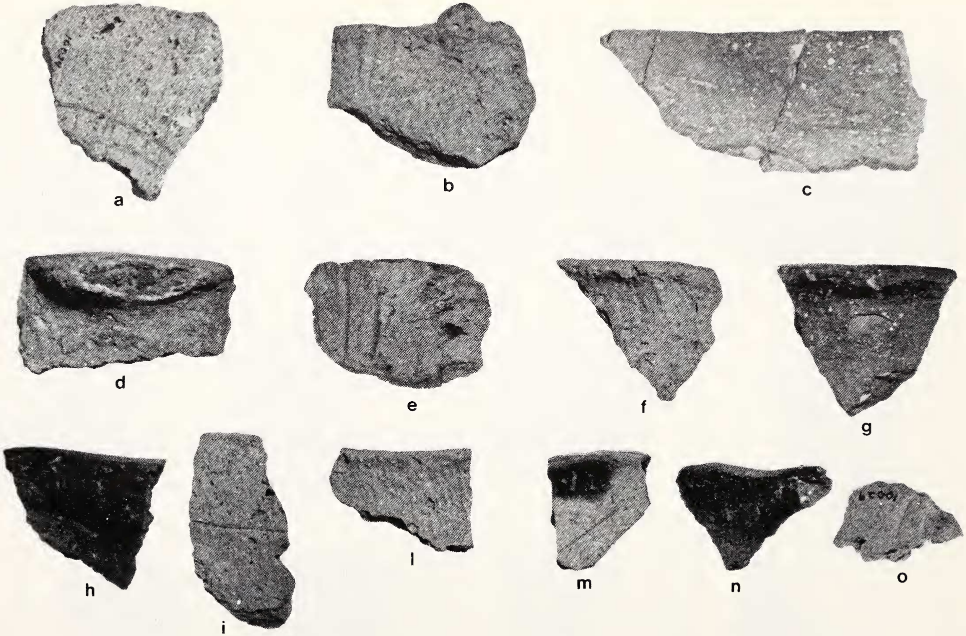


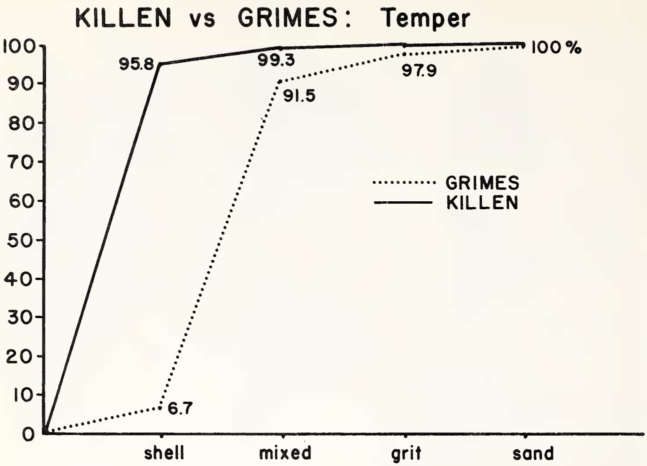
Plate 10. Various ceramics from Killen-Grimes-Wamsley; see text for descriptions.

ville Plain. Although several of the ceramic vessels from Killen-Grimes were decorated with a curvilinear guilloche, most were plain or smoothed over, without decoration. On three of the recovered vessels, the fine-line, angular incisions appear sufficient to relate them to Feurt Incised (Plate 9m, n), as they differ from Griffin's (1943) prototypic illustrations no more than do other shell-tempered, fine-line incised ceramics called Feurt at other sites (see Murphy 1975).

Several additional ceramics which occurred at the east end of the Grimes tract represent either a thin variant of Fayette Thick or a thick variant of McGraw (Plate 9l). Although not found in direct or in situ association, they were all located proximal to the seven stamped/brushed sherds (Plate 10h) from the feature at Grimes structure 1, which clearly represent Connistee types. Those ceramics were in some manner obtained from the Appalachian Summit during a Middle Woodland period which has repeatedly shown clear interaction with Ohio (Brose 1979; Keel 1977; Chapman 1973; Dickens 1976). These ceramics appear equivalent in paste to the "southeastern series" ceramics reported by Prufer (1968) from several Ohio Valley Hopewell sites (cf. Kellar 1979).

Seven complete and partial cordmarked and plain shell-tempered, edge-ground ceramic discs (Plate 10a, o, t) were also recovered: three from the Killen midden; two from the Killen structural area; and one each from the surfaces of Grimes and Killen. The only other excavated ceramic materials were 17 burned fragments of untempered clay daub (Plate 10i), most with twig and matting impressions on opposite sides. All were recovered from pits and postholes or from in situ subsurface contexts associated with the Killen structures (Brose 1979:236). In addition, unattached vessel handles with shell temper and with mixed shell and grit temper were recovered in various locations on the Killen Ridge (Plate 10p, s).

Spatial analyses of the recovered ceramics show minor but interesting areal differences (Figs. 13, 14). The Grimes tract yielded a slightly higher frequency of cordmarked surfaces and mixed- and grit-tempered paste. However, there were relatively few cordmarked and grit-tempered vessels recovered from Grimes. With the exception of the Middle Woodland structure and features, the subplowzone features at Grimes had a higher frequency of mixed-tempered and cordmarked surface vessels than did surface proveniences. This was significantly different from the ceramic attribute combinations seen on vessels recovered from similar proveniences at the Killen tract or from the Wamsley Village itself. Ceramic analyses have suggested that such minor differences in the frequency of attribute-combination variations among the ceramics recovered from var-



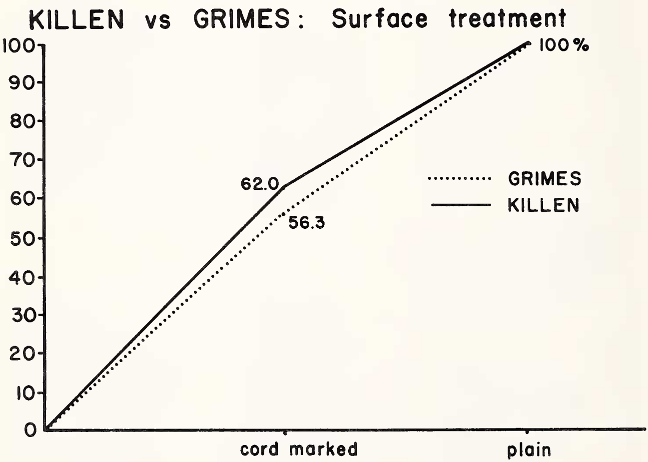


Fig. 13. Cumulative frequency distributions of ceramic temper and surface treatment comparing Killen and Grimes tracts.

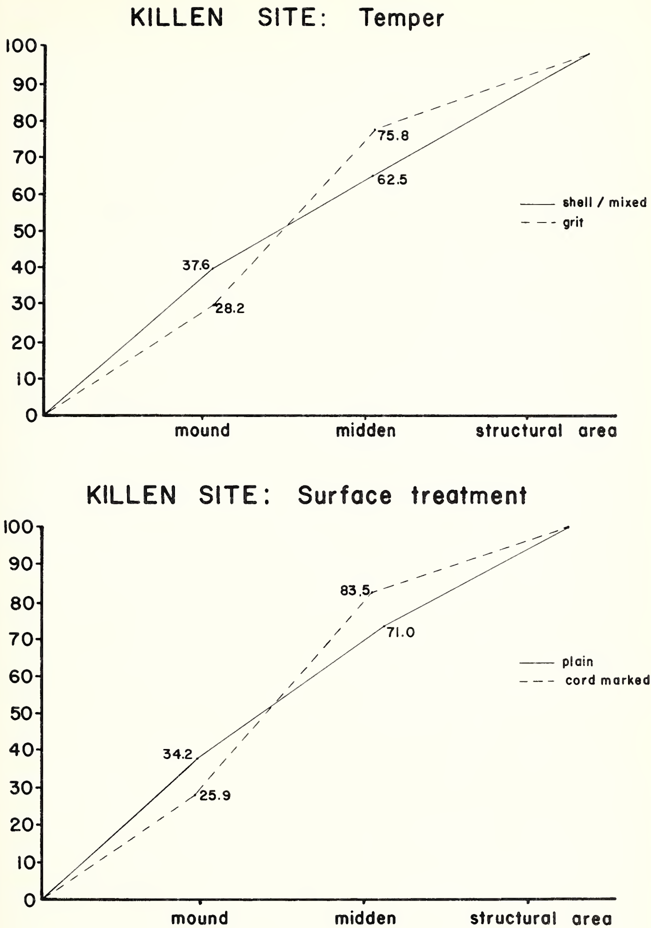


Fig. 14. Cumulative frequency distribution of ceramic temper and surface treatment from Killen mound, midden, and structural areas.

ious Killen structures may represent those slightly differing combinations of stylistic attributes which were due to the differing learning experiences of females from several social units of an extended family of sublineage nature (see Brose 1970a, 1970b, 1976b, 1979; Deetz 1964). The Killen-Grimes-Wamsley ceramic assemblage differences, although of a qualitatively greater scale, can still be considered statistically as samples from a single population (Brose et al. 1979:Tables 12–35). These differences are relatively unimportant in the archaeologist's sense of comparative regional ceramic typology; nonetheless, by virtue of the restriction to Wamsley and to the eastern end of the Grimes tract of certain ceremonially related functional types of ceramic vessel shape and surface treatment, it appeared that there were significant sociofunctional differences in the uses of ceramics between Wamsley Village and the east Grimes area and again between the Killen and the west-central Grimes areas. Salt pans (which may have had a ceremonial importance [Williams 1954, n.d.; Brown 1980]) and the more "Mississippian-shaped" open bowls are restricted to the Wamsley Village itself. Only lug-handled and small handleless vessels (primarily plain surfaced and with mixed shell/grit temper) occur at the large open burned areas located in the Grimes tract. The Killen structures yielded predominantly shell or mixed shell- and grit-tempered cordmarked and plain small bowls. These had a few narrow strap handles, and there were no lug handles recovered. The Killen midden ceramics appeared functionally similar to those from the Grimes tract, except that a wider range of vessel sizes occurred in the midden. This may reflect accumulation or redeposition from several primary disposal areas. In short, the detailed analyses of ceramics from Killen, Grimes, and Wamsley (Brose et al. 1979:228–244) suggest that to the extent that there is contemporaneity, the variability in ceramics represents not only social but also functional differences as well.

The external comparison of the Killen Ridge ceramics must, to a large degree, depend upon the validity of the established ceramic types as a nonrandom association of particular ceramic attributes themselves. As noted, there appears too little justification to uncritically continue to accept the traditional Fort Ancient ceramic typology of 1943 without revision (cf. Griffin 1978). Yet, it is still occasionally worthwhile to ignore such constraints and to proceed as if comparative ceramic typology was supportable. In such an exercise, the ceramic assemblage from Killen, characterized by a slight dominance of shell or mixed grit- and shell-tempered Madisonville/Fox Farm Cordmarked and Madisonville Plain pottery and the total absence of Anderson Cordmarked and Incised or Philo Punctate ceramic types, indicates that the Killen occupations may be placed within

the Madisonville-Clover focus of the Fort Ancient aspect (Griffin 1943, 1978; Mayer-Oakes 1955) or tradition (Essenpreis 1978). The absence of types such as Wellsburg Simple-Stamped (Mayer-Oakes 1955), or of European goods, or of any strong suggestions of southeastern cultural influences, argues for a placement somewhere prior to the "protohistoric period" (viz. Hanson 1966, 1975). This relatively early Madisonville equivalence is strengthened by the low frequencies of Feurt Incised and by the presence of the Baum (or Peters) ceramics which occur at Killen. Such placement is not without its disconformities, however, as many ceramic attributes of rim profile and handle morphology at Killen Ridge differ from those of other Madisonville sites such as Fox Farm, Larken, Campbell Island, Hardin, or Buffalo (Smith 1911; Hooten and Willoughby 1922; Griffin 1943; Hanson 1966, 1975), and these ceramic attributes at Killen diverge in the direction of the rather undistinguished Baum-related ceramics from the Brush Creek component (viz. Griffin 1943), geographically the closest described Fort Ancient component.

Comparative typological analyses of the Killen Ridge ceramics thus suggest that the Fort Ancient occupation can be placed within the Madisonville focus, but certain ceramic attributes suggest that this component should be relatively early in the development in that ceramic concatenation, postdating the (unconfirmed) early Brush Creek materials equated with Baum and predating the full protohistoric development of Madisonville as seen at Madisonville itself, or at the Hardin or Buffalo Villages. On the basis of ceramics alone, the Killen Fort Ancient occupation should fall between A.D. 1100 and A.D. 1400, making them coeval with the Anderson focus of the middle Miami and Little Miami (see Brose and White 1978; Heilman 1975), or with the Feurt focus of southeastern Ohio (Murphy 1975; Gartley et al. 1973; Carskadden and Morton 1977).

Lithic Materials

Fifteen different varieties of chert or flint have been identified in the lithic assemblage recovered from the Killen site. These include three Silurian cherts, one Devonian flint, three Mississippian flints, seven Pennsylvanian flints, and one material (pebble chert) of mixed geological association. These materials and their areal frequencies are listed in Table 2. In general, although the most recent formations contain the best material for tool production (the Silurian and Devonian cherts and flints are notably poor in quality and lighter in color when compared to siliceous Mississip-

TABLE 2

Chert and Flint Raw Material Varieties Present

Formation	*Geological Period*	*Outcrops*	*Relative Frequency of Occurrence at Killen*	*Relative Frequency of Occurrence at Grimes*	*Relative Frequency of Occurrence at Wamsley*
Brassfield	Silurian	SW Ohio	11.16	11.11	18.58
Bisher	Silurian	SW Ohio	18.45	20.70	19.62
Cedarville-Guelph	Silurian	W Ohio	13.21	2.36	2.85
Delaware	Devonian	C Ohio	3.87	5.44	2.95
Indiana Hornstone	Mississippian	SC Indiana	7.86	9.93	6.26
St. Louis	Mississippian	EC Kentucky	1.48	3.55	1.96
St. Genevieve	Mississippian	EC Kentucky	.91	4.02	1.70
Upper Mercer	Pennsylvanian	EC Ohio	1.14	.95	3.00
Kanawha	Pennsylvanian	C West Virginia	.11	2.36	2.59
Zaleski	Pennsylvanian	SC Ohio	.11	2.60	1.77
Vanport Ohio Flint Ridge	Pennsylvanian	C Ohio	.00	.71	1.50
Kentucky Flint Ridge	Pennsylvanian	EC Kentucky	.34	1.65	1.77
Brush Creek	Pennsylvanian	S Ohio	1.03	.00	5.28
Pebble Cherts	Mixed	Ubiquitous	33.14	15.84	13.43
Unassignable	?	?	18.56	16.78	16.74
Totals			100%	100%	100%

pian or Pennsylvanian material), Silurian cherts predominate in the Killen site lithic assemblage. Brassfield chert outcrops are prominent along Ohio Brush Creek and several of its tributaries in the dissected uplands of Adams and Highland Counties. The exposure immediately northwest of the mouth of Ohio Brush Creek, about 350 m from the site, was extensively exploited and is well represented in the primary lithic industries at Killen. Brassfield chert is more porous in texture, tan in color (sometimes with light gray mottling), and notably more fossiliferous than is the also common Bisher. Bisher chert is locally abundant in the upper Clear Creek and Scioto Brush Creek drainages of central Highland County and northwestern Adams County and occurs as pebbles in lower Brush Creek. Despite their name and their relative quality, the Brush Creek cherts, which occur as very limited outcrops capping some of the Adams County highlands, are somewhat rare at the site. However, there are clearly considerable areal differences in the use of the Brush Creek chert at the Killen-Grimes-Wamsley occupation, and more extensive excavation at the Wamsley Village portions may alter the overall picture.

The detailed lithic analyses (Brose et al. 1979:255–360) attempted to define functional artifact types based on selective microwear studies and reconstruction of manufacturing sequences, where possible. This resulted in several overlapping technological models which involved alternative sources of raw materials; differing initial core preparation and utilization (Brose et al. 1976); differing application of heat treatment; and differing reconstructed preform, blank, and finished artifact sequences with widely differing terminal functions for final, morphologically similar artifacts (e.g., Brose 1975; Brose et al. 1976). Some attempt was made to identify, in quasi-ethnographic terms, the inferred function of these "finished artifacts" and the utilized debitage (e.g., Brose 1975, 1978a; Barber 1978). Hard-hammer and soft-hammer percussion appear at all reduction stages, although more common earlier. Pressure retouch occurs in many final reduction stages, although it may be altogether absent. Thermal alteration, never common in any Fort Ancient tradition lithic assemblage (Barber 1978; Applegarth et al. 1978), may occur at any stage or may be absent entirely. The products of this lithic strategy, whether unfinished preforms, flakes debitage, or finished formal artifacts, display variations in their indication of utilization.

Killen's lithic debitage follows a complete processual continuum, from altered nodules recognizable as cores to small secondary thinning and trimming flakes representing many of the final detrital stages in the manufacture of finished forms. As seen from the tabulations presented in Table

3, all waste categories involved in the processing of chipped-stone implements are represented, signifying that some initial reductive operations were performed at the site rather than at quarrying or collecting localities elsewhere. A probable explanation for the relative scarcity of unmodified nodules and cores is the local availability of raw material. The prolific occurrence of Brassfield chert from the nearby outcrops and the chert pebbles in the bed of Ohio Brush Creek obviated accumulation of reserve supplies.

Utilized Debitage

Utilized debitage from all areas within the Killen-Grimes-Wamsley sample occurs at a ratio of 1:4.72 with unutilized debitage, or about 21.2% of the entire lithic assemblage. Of 280 pieces utilized, 42 were utilized block cores; 89 were utilized decortication flakes; 42 were utilized pebble cores; and 126 were utilized block flakes or other primary shatter. Not one of the secondary trimming and thinning flakes was utilized. Utilization may be characterized as a condition of advance edge attrition brought about by use without preliminary alteration (Hayden 1980; Brose 1975). Although considerable variability has been observed, much utilization takes the form of minute, clustered step or hinge scars occupying a continuous expanse of the flake margin. These scars are generally steep and abrupt, terminating no more than 2 or 3 mm back from the flake edge. There is also a marked tendency for unifacial utilization in that less than 27% of the sample ($n = 76$) displayed wear on both surfaces of a single edge. In addition to this utilized debitage, 22 deliberately retouched flakes (under 8%) were recovered. Al-

TABLE 3
Relative Frequencies of Debitage Categories,
Killen-Grimes-Wamsley Occupation

Pebble Core	7.67%
Pebble Core retouched	3.82%
Block Core	4.83%
Decortication Flake	31.82%
Decortication Flake retouched	7.47%
Block Flake right angle platform	5.34%
Block Flake right angle platform retouched	2.66%
Block Flake acute angle platform	3.97%
Block Flake acute angle platform retouched	1.35%
Block Flake without platform	21.38%
Block Flake without platform retouched	6.13%

though most debitage classes are represented, retouched forms are most frequent among cores (30%) and least frequent among decortication flakes (17%). This appears quite different from coeval assemblages in northern (Brose et al. 1976; Brose 1978) or central (Shane and Prufer 1970: personal communication; Barber 1978) Ohio. Detailed analyses (Brose et al. 1979: 305–333) have revealed that the distribution of utilized debitage from the Killen-Grimes-Wamsley Village occupation is quite variable (Table 4), suggesting that tasks which required the ad hoc use of cutting and scraping edges were also variably localized.

By virture of its relative frequency in comparison to finished artifacts, the Killen utilized debitage merits attention as an important, probably indispensable, functional constituent of the Fort Ancient lithic industry. Its recognition, furthermore, has some consequence not only in the presentation of more complete descriptive data but also in the analysis of tool typology. Unfortunately, because utilized debitage is rarely discerned or adequately described in site reports, its significance outside the immediate context of the Killen site must remain largely unexplored. The only comparable data are from Barber's analysis of the 1977 Anderson Village excavations, or from the 1978 analysis of the Bluestone chipped-stone industry. In the lithic analysis of the Fort Ancient component from Bluestone (Dwyer, in Applegarth et al. 1978), utilized debitage accounted for 34% of functional lithic tools and represented just under 3% of the total debitage recovered. At Anderson Village, Barber (1978) reported that 7.56% of the

TABLE 4
Lithic Retouch or Use Modification From Killen-Grimes-Wamsley Areas as Relative Frequency of Total Assemblage of Debitage Classes

Area	*Cores (%)*	*Decortication Flakes (%)*	*Other Flakes (%)*	*Total*
Wamsley Village	5.9	3.8	7.6	17.3
Grimes burned areas	2.4	3.3	2.3	9.0
Grimes Features	6.0	3.0	12.5	19.5
Killen Structure 2	3.0	3.0	3.1	9.5
Killen Structure 3	2.5	8.5	5.2	16.2
Killen Structure 4				
Killen Features	3.0	3.0	6.8	13.8
Killen Midden	2.0	5.5	4.1	11.2
Killen Burial Mound	0.9	1.5	2.1	4.5

lithic debitage showed signs of use and that this accounted for over 52% of all functional lithic tools recovered in the unbiased samples analyzed (Barber 1978:Table 1). At the Killen-Grimes occupation, over 75% of the 370 functional lithic implements consisted of utilized debitage. However, the surface collections and the four 1 x 1 m units excavated at the Wamsley Village yielded 27 formal tools and 42 utilized debitage fragments (identified at the Ohio Historical Society by Wesley Clark 1977; and the Cleveland Museum of Natural History by F. Chapman 1978), out of only 180 lithic specimens. It is suggested that the inordinately high relative frequency of the Wamsley functional tool ratios is the direct and artificial consequence of the fact that it is a functional segment of the Killen-Grimes-Wamsley complex.

Standard Flaked Implement Forms

The 107 deliberately shaped lithic artifacts recovered from the Killen site excavations consisted of 38 triangular projectile points; 14 triangular preforms; 3 triangular blanks; 7 triangular-to-ovate "preforms"; 6 finished ovate "knife" bifaces; 6 bifacial scrapers; 1 unifacial scraper; 6 gravers and/or drills; and 9 unassignable bifacially flaked implement fragments. In addition, there were 17 whole and fragmentary Archaic-Middle Woodland projectile points (Table 5; Plate 11).

Triangular Blanks represent the initial stage in artifact preparation following the removal of cortex from chert pebbles. All blanks show evidence of hard percussive flaking with deep, short flake scars often meeting at a medial ridge on both faces. Several display cortex on one face, usually near the base, and some show multiple hinge fractures at inclusions which could not be removed by flaking.

Triangular-to-Ovate Preforms, the next reduction stage, involved a finer percussion flaking technique, primarily from the base of the blank. Larger, broader flakes were removed across both surfaces from a single edge. These preforms demonstrate a consistent edge angle during this manufacturing stage. It is at this stage that the final basal morphology is established, as are the overall maximum width and length. Many of the triangular preforms have been halted at this manufacturing stage due to inclusions which resisted further thinning. These "humps" show repeated attacks from several directions, most of which resulted in hinge or step fractures without removing the "hump."

Triangular Projectile Points appear to all fall within the Levanna or Madison types (Scully 1951; Ritchie 1961). They have been transformed

TABLE 5

Metric Attributes of Lithic Artifacts From Structural Areas, Features, and Structures at Grimes and Killen Sites
(symbols identified at end of table)

Description	*CMNH#*	*PROV*	*L*	*W*	*T*	*HL*	*HWM*	*HWN*	*BL*	*BW*	*STL*	*WT (g)*	*RM*
Madison Proj. Pt. Frag.	10397	Grimes F #15	3.23	2.20	0.79							3.52	C-G
″	10697	″	*	2.54	0.46							2.52	Bi
Chesser Proj. Pt. Frag. Notched	10353	Grimes Hearth V	*	2.05	0.59							4.19	Bi
Hafted End Scraper (Stemmed)	10353	″	3.99	3.32	1.17	1.50	2.21	2.14	2.49	3.32		14.68	Br
Chesser S-N	10379	″	3.16	1.73	0.70	0.95	1.24	1.06	2.21	1.73	2.55	3.06	KFR
Nashport Proj. Pt. Frag.	10379	″	*	3.32	0.79	1.80	2.18	1.61		3.32		10.61	OFR
Madison Proj. Pt.	9754	Killen Subzone	3.78	1.47	0.66							2.36	U
McWhinney S-N Proj. Pt.	9982	K. Clay Below PZ	4.83	2.15	0.94	1.69	1.30	1.28	3.14	2.15	3.47	8.60	OFR
Subrectangular Scraper	10393	Grimes F #15	6.42	3.67	1.65							47.01	Br
Preform	10381	Grimes F #7	3.62	2.84	1.20							10.23	OFR
Drill Frag.	10394	Grimes F #16	*	2.57	0.87							7.05	PC
Ovate Blade Frag.	10403	Grimes F #13	*	2.34	1.27							10.09	Bi
Ovate Blade Frag.	10114	Killen Struc. 3	*	2.05	0.62							2.57	Bi
Ovate Blade Frag.	10100	Killen Struc. 3	*	1.80	0.59							2.78	Bi
Subrectangular Scraper	10101	Killen Struc. 3 PM #35	2.40	2.78	0.76							5.67	PC
Drill	10088	Killen Struc. 3	4.82	2.42	0.73							6.04	U
Madison Proj. Pt. (Frag.)	10088	″	*	1.99	0.63							3.25	OFR

TABLE 5 (*continued*)

Metric Attributes of Lithic Artifacts From Structural Areas, Features, and Structures at Grimes and Killen Sites

Description	*CMNH#*	*PROV*	*L*	*W*	*T*	*HL*	*HWM*	*HWN*	*BL*	*BW*	*STL*	*WT (g)*	*RM*
Madison Proj. Pt.	10092	PM #15	2.07	1.38	0.70							1.35	U
Chesser S-N Proj. Pt. Frag. (Aff.)	10088	Killen Below Struc. 3	*	2.97	0.64			1.45	2.09	2.97	2.53	4.76	OFR
Hafted S-N End Scraper	10103	Killen Struc. 3 PM #38	1.87	2.73	0.63	1.10	2.04	1.66	0.77	2.73		3.21	KFR
Levanna Proj. Pt.	10060	Killen F #31	2.62	1.74	0.50							1.75	OFR
Madison Proj. Pt.	10060	"	4.64	1.96	0.51							3.12	Br
Long, Thick Bifacial Knife	9745	N986 W1000, PZ	6.08	1.95	1.45							15.95	PC
Madison Proj. Pt. (Frag.)	9997	N1000-40 W1017-40 Grader Cut	*	2.30	0.59							4.45	UM
"	9997	"	*	1.79	0.50							2.23	PC
"	9997	"	*	2.18	0.56							2.76	Bi
"	9997	"	*	1.78	0.58							3.37	KFR
Preform	10003	Grader Cut #1 North, PZ	4.41	2.11	0.94							8.37	PC
Blank	10005	Grader Block #2, Surface	5.00	3.00	1.63							20.93	PC
Preform	10005	"	4.70	3.66	1.75							27.41	Br
Ovate Preform	10005	"	4.27	3.35	1.64							19.93	U
Ovate Preform	10005	"	4.90	2.63	0.82							10.54	PC
Preform	10005	"	6.16	3.00	0.98							16.95	PC
Ovate Knife	10005	"	6.10	2.48	1.04							13.68	Br
Madison Proj. Pt. (Frag.)	10005	"	*	2.06	0.70							4.40	St.L.
Ovate Preform	10012	"	6.78	3.69	1.94							47.01	Br

Rectangular													
Scraper	10012	″	6.77	3.60	1.08							31.39	St.L.
Preform	10012	″	4.78	2.44	0.91							8.82	PC
Madison Proj. Pt.	10012	″	*	1.65	0.36							1.42	Br
Madison Proj. Pt.	10011	″	*	1.94	0.45								
Madison Proj. Pt.	10011	″	*	1.94	0.45							2.58	Bi
Madison Proj. Pt.	10011	″	3.70	1.80	0.48							2.50	OFR
Ovate Preform	10006	″	3.46	2.13	1.03							6.67	Br
Preform	10009	″	5.10	2.57	1.40							13.74	Br
Ovate Preform	10009	″	4.35	2.35	0.94							8.40	PC
Brewerton S-N													
Proj. Pt.	10010a	″	3.67	1.93	0.75	1.18			2.49	1.93	2.70	4.59	Br
″	10010b	″	*		0.67	1.23	2.45	1.85				3.58	Br
McWhinney H.S.													
Proj. Pt.	10014	″	5.23	2.82	0.97	1.24	1.21	1.16	3.99	2.82	4.28	11.88	Br
Chesser C-N													
Proj. Pt.	10020	″	*	3.27	0.58	1.30	1.76	1.30		3.27		5.29	U
Fragments	10010	″	*	2.60	0.62							3.29	Br
Fragments	10010	″	*	2.33	0.70							7.74	Br
Preform	9763	″	6.53	2.27	1.26							23.72	PC
Preform	9986	″	4.35	2.71	1.33							10.01	PC
Preform	9986	″	4.56	2.45	0.93							7.73	Br
Ovate Preform	9749	″	4.23	2.42	1.03							7.68	U
Scraper Bipointed	9765	″	5.19	1.74	1.26							9.93	Br
Ovate Blade	9752	″	4.18	2.79	1.25							11.77	U
Madison Proj. Pt.													
Frag.	9758	″		2.18	0.52							2.82	U
Madison Proj. Pt.	9986	″	3.53	1.77	0.63							3.06	U
Levanna Proj. Pt.	9987	″	3.75	2.05	0.75							3.59	PC
Blank		Grimes PZ,											
	10370	Various Localities	6.16	4.30	2.19							56.85	Br
Preform	10372	″	3.78	2.27	0.95							8.00	PC
Preform	10397	″	3.74	2.57	2.66							11.46	PC

TABLE 5 (*continued*)

Metric Attributes of Lithic Artifacts From Structural Areas, Features, and Structures at Grimes and Killen Sites

Description	*CMNH#*	*PROV*	*L*	*W*	*T*	*HL*	*HWM*	*HWN*	*BL*	*BW*	*STL*	*WT (g)*	*RM*
Preform	10368	″	4.98	3.75	1.41							27.42	OFR
Preform	10373	″	4.61	2.76	1.90							20.82	OFR
Drill Frag.	10372	″	*	2.26	0.50							1.68	Br
Madison Proj. Pt. Frag.	10373	″	*	1.51	0.34							1.07	D
Madison Proj. Pt.	10328	″	3.08	1.93	0.45							2.05	Bi
Preform	10371	″	4.24	2.41	0.74							7.31	PC
Hafted S-N Scraper	10371	″	2.80	1.90	0.69	1.36	1.87	1.33		1.90		4.05	U
Madison Proj. Pt. Frag.	10373	″	*	1.94	0.67							2.93	Br
Levanna Proj. Pt.	10373	″	2.96	2.33	0.54							2.49	U
Blade Frag.	10372	″	*	2.85	0.81							7.72	U
Madison Proj. Pt. Frag.	10374	″	*	2.07	0.55							3.11	Bi
″	10374	″	*	2.34	0.66							3.31	Bi
Levanna Proj. Pt. Frag.	10372	″	*	2.89	0.59							2.98	OFR
Madison Proj. Pt. Frag.	10372	″	*	1.91	0.50							1.79	Z
″	10372	″	*	2.00	0.51							3.02	Bi
Hafted Scraper Stemmed	10371	″	3.64	2.90	0.77	1.55	2.43	2.25	1.21	2.90		9.06	U

Chesser S-NP	10392	″	2.83	1.42	0.58	0.85	1.42	1.15	1.98	1.41	2.17	2.21	KFR
Stemmed Proj. Pt.													
Frag.	10320	″	*	*	0.87	2.16	1.48	1.45				7.62	OFR
″	10316	″	*	2.70	0.80	0.78	1.30	0.83		2.70		6.77	Br
McWhinney													
Heavy Stemmed													
Proj. Pt.	10342	″	4.58	2.93	0.98	1.77	1.69	1.56	2.81	2.93	2.95	10.92	Br
McWhinney Proj.													
Pt. Frag.	10372	″	*	2.61	0.96	1.67	1.58	1.49		2.61		8.96	U
Brewerton E-N													
Proj. Pt. Frag.	10363	″	*	2.62	0.75	1.57	2.62	1.94		2.02		5.60	U
Brewerton S-N													
Proj. Pt. (Frag.)	10316	″	*	2.10	1.04	1.23	1.94	1.60		2.10		7.46	PC
MacCorkle (Frag.)													
Bifurcate Base	10360	″	*	*	*	1.17	2.34	2.24				5.15	PC
Ovate preform	10052	Mound	6.08	3.17	1.40							23.56	PC
Expanding Stem													
Frag.	10026	″	*	2.85	0.84	1.35	2.53	2.00		2.85		10.99	OFR
Madison Proj. Pt.													
Frag.	10022	″	*	2.10	0.62							3.80	Bi
″	10033	″	*	2.14	0.56							4.90	Bi
″	10019	″	*	2.08	0.46							3.34	U
Madison Proj. Pt.	10046	″	2.09	1.33	0.41							1.57	OFR
Madison Proj. Pt.	10046	″	2.45	1.46	0.22							1.30	U
Drill Frag.	10043	″	*	1.68	0.64							4.64	PC
Blank	10055	K. Mid.	7.08	4.70	2.31							68.19	Br
Preform	10055	″	5.32	2.94	1.28							16.83	PC
Drill Frag.	None	″	*	1.39	0.55	0.67	1.40					1.66	OFR
Drill Frag.	10318	″	*	1.49	0.52	1.11	1.49			0.96		1.72	U

TABLE 5 (*continued*)

Metric Attributes of Lithic Artifacts From Structural Areas, Features, and Structures at Grimes and Killen Sites

Description	*CMNH#*	*PROV*	*L*	*W*	*T*	*HL*	*HWM*	*HWN*	*BL*	*BW*	*STL*	*WT (g)*	*RM*
Madison Proj. Pt. Frag.	10318	K. Mid.	*	1.74	0.43							2.05	U
"	10318	"	*	1.44	0.70							3.03	U
Madison Proj. Pt.	10318	"	3.15	1.57	0.44							1.67	Bi
Madison Proj. Pt. Frag.	10055	"	*	1.57	0.38							1.68	Bi
Madison Proj. Pt.	10161	"	2.88	1.60	0.62							2.55	Bi
Levanna Proj. Pt.	10318	"	2.11	1.95	0.46							1.69	Br
Constricted Stem Proj. Pt. (not Archaic)	10161	"	3.87	1.70	0.77	1.28	1.15	1.06	2.57	1.70	2.88	2.66	Bi
Jack's Reef Pentagonal Proj. Pt.	10318	"	3.31	2.42	0.67							5.25	Bi

The following abbreviations have been employed:

Proj. Pt. - Projectile Point

CMNH# - Sequential Cleveland Museum of Natural History catalog number assigned to the provenience unit from which the materials were recovered. Individual artifacts carried subscript notation not reproduced in this table.

PROV - Provenance in terms of aboriginal cultural manifestation.

L - Maximum length in mm.

W - Maximum width in mm.

T - Maximum thickness in mm.

HL - Length of hafting element on point or knife or hafted scraper (see Binford 1963).

HWM - Maximum width of hafting element in mm.

HWN - Minimal width of hafting element in mm.

BL - Length of blade (cutting edge) in mm.

BW - Width of blade in mm.

STL - Length of stem in mm.

WT - Weight in grams.

RM - Raw material from which artifact was fashioned (see section on lithology for symbols.

* - Broken along measured vector.

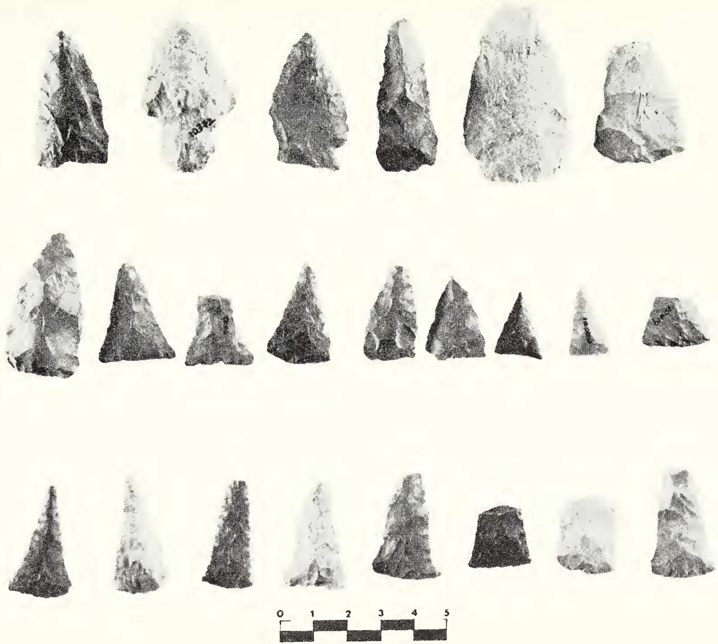


Plate 11. Chipped-stone artifacts from Killen-Grimes-Wamsley; see text for descriptions.

into finished projectile points by soft percussion flaking to thin the artifact without reduction in any other dimension, followed by the removal of a series of long shallow secondary (probably pressure) retouch flakes to create a consistent acute edge.

Triangular Bifacial Knives display scalar flake scars and small chipping scars along a single face of any edge. The degree of gloss on scar ridges and short transverse-to-oblique striations suggest use as a knife or an occasional scraping tool. These triangular bifacial "knives" differ in nearly all metric characteristics from the finished triangular projectile points described above. They do not, however, differ significantly from triangular preforms subsequently utilized as knives or scrapers (Table 6). Thus they represent an alternate pathway following the blank, which was determined *prior* to trimming to triangular preforms. Large blanks were selected for bifacial scrapers and thinned without the length or width reduction which

TABLE 6
Some Summary Statistics for Lithic Attributes (in mm) from Fort Ancient Component of Killen-Grimes-Wamsley

Attributes	*Symbol*	*L*	*W*	*T*
Blanks	n	3.00	3.00	3.00
	$\bar{x}$	60.80	46.20	20.40
	σ	10.40	15.80	3.63
	c.v.	.17	.34	.18
Preforms	n	12.00	14.00	14.00
	$\bar{x}$	36.76	23.34	17.84
	σ	7.95	13.71	3.35
	c.v.	.22	.59	.19
Madison Points	n	29.00	37.00	31.00
	$\bar{x}$	26.21	19.80	8.86
	σ	6.50	4.27	1.19
	c.v.	.25	.22	.13
Knives	n	6.00	6.00	6.00
	$\bar{x}$	38.20	28.60	18.52
	σ	11.70	9.40	3.67
	c.v.	.31	.33	.20
Bifacial Scrapers	n	6.00	6.00	6.00
	$\bar{x}$	62.78	51.97	11.43
	σ	10.99	17.28	2.33
	c.v.	.18	.33	.20

characterized those triangular preforms destined for reduction to projectile points. In contrast to sites in northern Ohio (Brose et al. 1976; Brose 1978b), among these triangular artifact classes at Killen the percentage of transverse-edge retouch shows more variation among *deliberately manufactured* bifacial scrapers than among blanks, preforms, or points *utilized* as bifacial knives or scrapers. Artifacts from every class, showing transverse retouch, were examined to determine how closely the spatial distribution of such retouch along the periphery approximated the expected distribution for discrete random occurrences along a continuous line. At Conneaut Fort, the finished projectile points display a random distribution of transverse retouch, while all other artifact classes displayed clustered-use retouch along the basal edges which exceeded the expectations of a Poisson distribution at a 95% confidence interval (Brose et al. 1976). At Killen this retouch clustered. For preforms utilized as knives or scrapers, as well as for the deliberate or predetermined bifacial knife-scrapers themselves, such transverse retouch localization in frequency alone does not distinguish between artifact classes. Previous interpretations suggested that such randomly located step and scalar fracture patterns resulted from nonscraping activities during use as a penetrating point (Brose et al. 1976). It now appears that the regularity of such retouch may be one type of the culturally determined group norm. In this light, one should review the "humpback knives" reported from the Ohio Valley and Illinois (Munson and Munson 1972; Hall 1974). While these Killen data are suggestive only, there does appear to be some distinction in lithic microstylistic traditions between the Iroquoian-related Whittlesey populations of northern Ohio (Brose 1973, 1978; Brose et al. 1976) and the Ohio River valley Fort Ancient groups in southern Ohio. Similar analyses at additional Fort Ancient sites will be needed to test this hypothesis.

Bifacial Ovates display evidence for primary use as knives, as do the bifacial triangular knives. It is hypothesized that they were manufactured from a larger nontriangular blank, possibly directly from a large secondary flake or split pebble core. The total absence of unfinished examples at Killen-Grimes suggests either that the knapping of such artifacts was carried out at Wamsley, or that few production mistakes occurred in their manufacture.

Bifacial Scrapers were "egg shaped" in general outline, and most showed localization of scraper retouch along the broader distal edge. Several displayed convergent scraper retouch along the lateral and proximal edges, and two bifacial scrapers showed discontinuous (denticulate or spokeshave) retouch along distal, proximal, and one lateral margin. This mor-

phologically variable class could be broken into such categories as disc scrapers, denticulate scrapers, side scrapers, and convergent scrapers.

Unifacial Scrapers were made on broad expanding decortication flakes with secondary trimming on their dorsal surface only. Scraper retouch occurs along the distal edge or along the distal and lateral edges alone. Working-edge angles are more acute than those of bifacial scrapers, although such retouch tends to cover a broader portion of the flake periphery. This class displays greater morphological homogeneity than the bifacial scrapers, although this may be sampling error. The unifacial scrapers at Killen are "thumbnail" or small end scrapers in the general taxonomic terms (Brose 1973; Mayer-Oakes 1955).

Drills represent either expanded-base or T-shaped drills, and all display heavy polish and striation on the "bit" portion. The base (where present) shows small marginal fracture scars and a distinct lack of gloss on flake-scar ridges. This suggests that these drills may have been hafted rather than handheld.

Bifacial Choppers are similar to the ovate bifacial knives, although thicker and considerably larger. Both choppers were manufactured from large chert pebbles, and cortex is present on both faces. Knapping was hard-hammer percussion, with deep, short flake scars showing strong negative bulbs and radial shatter lines. Edge modification appears to have been minimal. Although polish, minute chippery, and striations exist on edges and faces, these form no clear pattern either in location or in inferred function. These implements seem to represent multipurpose, heavy-duty tools which, no doubt, fulfilled numerous industrial roles, few of which can be identified.

Miscellaneous Bifacial Fragments recovered from the excavations were too small to be unambiguous in their functional or morphological assignment. Two bladelet fragments appear to have been made on concavo-convex flakes. Basal width for these two fragments appears to have exceeded 20 mm, which is outside the range for either Hopewell or Fort Ancient bladelets from Anderson Village (White 1968; Barber 1978).

Several fragments represent bifacial blanks on the basis of size and orientation of flake scars and the freshness of the bifacially flaked edge along with an absence of secondary edge trimming. Two of these were utilized as knives or scrapers.

In addition to these analyses of the Fort Ancient lithic materials from the Killen-Grimes sites, some mention must be made of the 18 projectile points which have been (arbitrarily) assigned to non–Fort Ancient assemblages. Three "corner-removed" points were recovered from the hearth in struc-

ture 1 at Grimes, in close proximity to the aberrant ceramics of Middle Woodland affinity; 2 Late Archaic stemmed and notched points were recovered from basal clay subsoil below Fort Ancient structures; 11 Middle Archaic points were from plowzone or surface collections scattered over an area of nearly 350,000 m^2; and the only nontriangular points from in situ Fort Ancient deposits were Late Woodland, Chesser or Jacks Reef variants.

Lithic analyses confirm the existence of functional differences between the Wamsley-Grimes-Killen occupations (Table 5). Lithic debitage suggests differing functional roles for the use of areas of Killen-Grimes and Wamsley in terms of the sequences of lithic reduction activities. While structural and nonstructural areas of the Killen tract differed slightly from each other, all of them differed more significantly from the Grimes tract (Brose et al. 1979:247–350). The Grimes tract can best be characterized as an area where initial lithic reduction occurred; the Killen structural areas can best be characterized as an area of secondary knapping, or lithic reduction for final shaping; the Killen midden, while it might be characterized as an area where all phases of reduction occurred, appears primarily to represent an area where previously chipped core fragments from other zones were relocated either for disposal or for functions still unknown.

Analyses of the utilized debitage have complemented this picture. Such analyses reveal that little of the lithic debitage was actually used on the Grimes tract, although broken scrapers and drills were numerous. Within and around each of the Killen structures were areas where the lithic debitage had been intensively utilized as tools for a variety of light cutting and scraping activities: the discarded lithic material from nearly all such activities had been recovered from immediately outside the structure doorways. The Killen midden showed a lesser use of a wider variety of ad hoc heavy cutting and scraping activities, which were accomplished, for the most part, by otherwise unprepared waste flakes.

Other Lithic Artifacts

The extensive excavations of the Killen-Grimes tracts and the test excavations at Wamsley Village yielded the surprisingly low number of 23 whole and fragmentary pecked and/or ground-stone artifacts (see Plate 12). These were distributed among the following representative classes: 13 rough hammerstones; 4 celts or fragments thereof; 3 anvils; 1 "nutting-stone"; 1 teshoa or chopper; and 1 discoidal or "chunky stone." There were

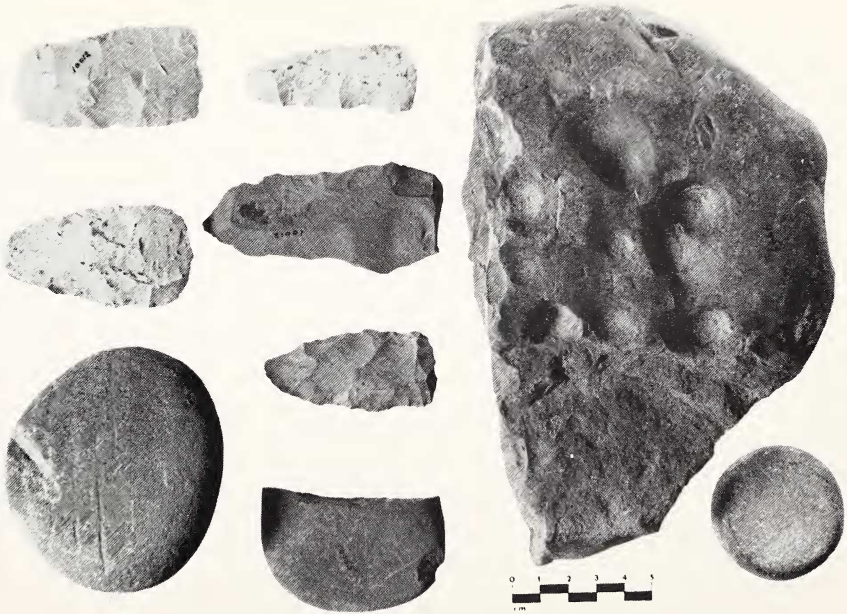


Plate 12. Chipped-stone bifacial knives and selected ground-stone artifacts from Killen-Grimes-Wamsley; see text for descriptions.

no non-fire-cracked fragments recovered which could not be assigned to one or another of these categories. A metric description of these artifacts is presented in Table 7, and detailed descriptions may be found in Brose et al. (1979:336–348). One noteworthy aspect of this industrial assemblage is the total absence of the sandstone abrading stones which appear to be a common Fort Ancient characteristic (Griffin 1943).

These ground-stone tools, although everywhere infrequent, showed striking functional variability in their distribution on the Killen-Grimes tracts: "nutting-stones" were confined to the Killen midden; rough anvil stones occurred in the Killen midden and at the Killen structural area; hammerstones occurred at Killen and Grimes in nonstructural areas; and gorgets, celts, axes, adzes, and pipes did not exist on Killen-Grimes tract zones, although many have been recovered from the Wamsley Village itself (Riggs, personal communication; Otto 1976; Kelley 1976; Servey 1961; Hayes 1957). The only chunky stone recovered from excavations was from the Killen midden. These distributions all suggest that only when Killen, Grimes, and Wamsley are viewed as a single community can the artifact inventory be considered fully representative of a Fort Ancient occupation (cf. Griffin 1943).

Unfortunately, there are few detailed lithic analyses of Fort Ancient assemblages for comparative purposes. Other than Barber's (1978) analysis of a restricted sample of lithic material from Anderson Village on the Little Miami River and Dwyer's analysis of the Fort Ancient lithic assemblage from the Barker site (in Applegarth et al. 1979), *no* analyses of Fort Ancient debitage have ever been published. In the Barber and Dwyer studies, emphasis was placed upon particular aspects of the lithic analyses so that only partial comparisons may be justified, and these must be tempered by the variables particular to respective sites and to sampling differences. Still, the Anderson Village and Barker sites show no significant differences from the Killen data. For that matter, there appears to be little significant difference between *any* reported Fort Ancient lithic assemblage. Triangular knives, ovate bifacial knives, bifacial scrapers, unifacial thumbnail scrapers, and drills are common in most Late Woodland and Mississippian manifestations within the Midwest. While Hall (1974) has suggested that a low relative frequency of end scrapers was an indication of Upper Mississippian affiliation, quantified data to support such a suggestion cannot be found in the literature for Fort Ancient or for those unassigned "Upper Mississippian" components in western Ohio (see Brose et al. 1979:333–335). The low relative frequency of deliberate end scrapers at Whittlesey sites in northeast Ohio (Brose et al. 1976), a decidedly Woodland phenomenon by most crite-

TABLE 7
Ground and Pecked Stone Artifacts from Killen-Grimes, Adams Co., Ohio (in cm)

Type	*Max. Length*	*Max. Width*	*Max. Thickness*	*Material*	*Weight (grams)*
			Grimes Surface and Plowzone		
Chopper/Teshoa	18.70	7.93	2.15	Black (Cleve.) Shale	236.4
Taper-Poll Celt Fragment	5.45	4.50	2.10	Soda Granite	103.3
Taper-Poll Celt Fragment	3.55	2.00	1.20	Soda Granite	244.1
Unfinished Discoidal	3.65	3.50	1.45	Waverly Sandstone	71.0
Hammerstone	6.75	7.00	5.25	Bisher Chert	502.6
Hammerstone	6.99	6.72	4.70	Basalt	457.9
Hammerstone	7.50	5.66	2.30	Oolithic Limestone	296.0
Hammerstone	7.55	7.15	5.61	Gneiss	24.3
Hammerstone	9.29	8.89	8.35	Bisher Chert	678.7
Hammerstone	12.50	8.40	8.25	Granite	1021.6
Hammerstone	14.15	9.33	8.81	Felsite	900.3
Hammerstone	15.75	10.50	9.50	Granite	975.2
			Killen Surface, General		
Grooved Axe	8.60	5.00	2.20	Felspar Granite	296.6
Hammerstone	7.71	4.16	4.00	Granite/Gneiss	364.1
Hammerstone	9.10	9.12	8.75	Basalt	781.0
Hammerstone	11.30	7.36	5.25	Felsite	613.6
			Killen Midden Area		
Nutting-Stone/ Metate	30.21	23.47	6.95	Anorthositic Diorite	846.1
Grooved Axe	9.75	6.50	3.12	Diabase	344.1
Anvil	17.35	11.20	8.00	Waverly Sandstone	1820.2
Hammerstone	4.66	3.90	3.12	Gabbro	130.1
			Killen Structural Area Plowzone		
Anvil	19.00	16.22	8.55	Waverly Sandstone	2003.3
Anvil	16.50	12.75	6.33	Waverly Sandstone	743.7
Hammerstone	8.55	7.95	5.90	Quartzite	557.2

ria, did not further such interpretations, although the situation at Killen does not oppose it. The Killen chipped-stone materials are similar to those recovered from coeval sites in New York state, especially Early Iroquoian sites of the Oakfield phase in the Niagara Frontier region (White 1961, 1976; Schock 1976). Coeval sites in Ontario yield similar chipped-stone assemblages (Wright 1966), although complete quantified data are not available. In eastern Michigan the components of this time period (Fitting 1965, 1970) yield morphologically similar materials, although most such sites represent seriously mixed occupations. Lithic analysis of coeval single-component sites in southern Ohio, northern Kentucky, or western Pennsylvania seem to have been ignored. In light of these problems, little more can be said than that the Killen lithic assemblage is not dissimilar from numerous other late prehistoric occupations of the eastern United States which are distinguished primarily on ceramic criteria.

Organic Remains

The analyses of recovered floral and faunal remains, although limited, unambiguously indicated that the Killen-Grimes tract was a hunting/gathering resource site, occupied at all seasons during the Fort Ancient period. The analyses suggest, however, that the bulk of the subsistence economy was probably based upon a commitment to maize-beans-squash agriculture (see Ford 1979). While several large mammals appeared to have been cooked and consumed in areas immediately adjacent to the Killen structures, those fauna did not appear to have been butchered there (Storch 1979). Furthermore, these analyses strongly indicate that the remains of most of the subsistence resources which would have been required to support the Killen structure occupants were not discarded nearby. The likely explanation for this fact is that most subsistence resources were in fact not consumed at those locations.

Radiocarbon Determinations

From the Cleveland Museum of Natural History archaeological excavations at Killen-Grimes and from the limited salvage and testing undertaken at Wamsley, 10 in situ samples were submitted for age determinations. One of these samples (DIC–857A) yielded a modern reading (A.D. 1870), suggesting recent disturbance. The remaining uncorrected determinations are discussed below.

DIC #851: Charcoal in small fill lens associated with shallow pit containing Midden Burial 1 at Killen tract. Charcoal tentatively identified as *Carya* or *Jugulans*. Very small sample which yields a large standard deviation.

B.P. 750 ± 205
A.D. 1200

DIC #852: A mixed sample of hand-collected fragments and the coarse flotation fraction from feature 13 sheet midden at the Grimes tract. These fragments have been tentatively identified as representing three distinct hardwoods among which were *Acer* and *Querqus*. Feature 13 yielded charred faunal remains, fragments of pelycepod valves, and mixed shell- and grit-tempered Madisonville / Fox Farm Cordmarked ceramics.

B.P. 680 ± 70
A.D. 1270

DIC #853: Fragments of probable *Carya* saplings burned in place as three post molds from the south wall of structure 3 on the Killen tract. Very small sample with some rootlet contamination.

B.P. 710 ± 205
A.D. 1240

DIC #854: Small charcoal fragments (twigs of *Carya, Querqus*, and *Fagus*) recovered from coarse-fraction flotation from apparent hearth (feature 4), 45–52 cm level, Test Unit 2, Wamsley Village, on knoll south of mouth of Brush Creek. Associated with midden yielding abundant faunal remains, Madison Projectile points, shell-tempered Fox Farm salt pan fragments, and mixed grit- and shell-tempered Madisonville Plain ceramics.

B.P. 710 ± 105
A.D. 1240

DIC #855: Fragments of *Carya* and *Populus* saplings associated with burned daub fragments. Burned wall, feature 10, Grimes tract.

B.P. 760 ± 150
A.D. 1190

DIC #856: Charcoal fragments selected from massive shallow charcoal

concentration in prepared-clay hearth, feature 34 within structure 2, Killen tract. Charcoal not identified as to species. Associated with lithic debitage and mixed shell- and grit-tempered bodysherds of Madisonville Cordmarked and Plain ceramics.

B.P. 640 ± 80
A.D. 1310

DIC #857B: Small fragments of *Querqus, Fagus*, and *Salix* charcoal from small logs on the surface of the submound clay level, 0.40 m below sand cap of mound on Killen tract. Associated with 27 semiflexed and extended human burials covered with sterile sands and midden fill containing Madisonville/Fox Farm ceramic assemblage.

B.P. 780 ± 95
A.D. 1170

DIC #861: Unidentified charcoal fragments from a fire-cracked, rock-filled pit, feature 4, within Grimes structure 1, eastern end of Grimes tract. Associated with McGraw Cordmarked and Connistee Brushed-Stamped ceramics and with corner-removed projectile points of Ohio Flint Ridge chalcedony.

B.P. 1430 ± 110
A.D. 520

DIC #862: Small fragments of *Querqus, Acer, Ulmus*, and *Carya* charcoal recovered in coarse-fraction flotation from midden level, 42–45 cm below plowzone, Test Unit 2, Wamsley Village. Associated with mixed shell- and grit-tempered horizontal lug handle, Madisonville Cordmarked rimsherd.

B.P. 620 ± 80
A.D. 1330

With the exception of sample DIC #861, which dates the Middle Woodland occupation of Grimes structure 1, the remaining acceptable eight radiocarbon determinations can all be considered to represent a single population with an average date of A.D. 1236 ± 87 (Long and Rippeteau 1974: 206–208). And while samples DIC #851 and DIC #853 have large single standard deviation values, weighting these still suggests a single acceptable range with the best estimate for the contemporaneous occupation of Killen-Grimes-Wamsley at A.D. 1236 ± 87. The date from the Middle

Woodland Grimes structure 1, feature 4, would be rejected on both statistical and archaeological grounds.

These radiometric dates as discussed are uncorrected dates based on a 5568 half-life. Correction to calendrical dates, based on the most detailed calibration available (Damon et al. 1974), suggests very little change. Corrected calendrical dates will range from A.D. 1187 to A.D. 1312 (and with the best estimate average at A.D. 1237) for the Fort Ancient occupation of the site. The Middle Woodland occupation remains unchanged at A.D. 520.

These dates are extremely close to the dates estimated on the basis of archaeological typology. They strongly confirm the interpretation of socio-functional variation by a single population at Killen-Grimes-Wamsley.

Comparative Analyses

The general comparative aspects of the material recovered from the Killen-Grimes-Wamsley excavation can be dealt with in detail. In general terms, the Killen occupation ceramic assemblages are typologically intermediate between Griffin's (1943) Baum focus (in which he included the post-Hopewellian Brush Creek component) and his pre– or non–Clover Madisonville focus. Thus, they should date, by ceramic seriation, between A.D. 1100 and A.D. 1400. Comparative lithic analyses also suggested that the predominantly Madison projectile points from the Killen-Grimes-Wamsley occupation (Plate 11) should be typologically later than those more Levanna-like and Chesser points from Blain at A.D. 900–1100 (Prufer and Shane 1970), more or less equivalent to the major component at Anderson dated A.D. 1220 (Essenpreis 1978) and earlier than the very narrow points from the Late Anderson occupations of the Caesar Creek valley (Brose and White 1978) which were dated between A.D. 1350 and A.D. 1480. In a similar broad comparison, the Fort Ancient features and structures of the Killen-Grimes tracts should be seen as typologically intermediate between the earlier Baum focus structures reported at Gartner (Mills 1906) and Blain (Prufer and Shane 1970) and the later-protohistoric Madisonville structures from the Slone (Dunnell et al. 1971), Hardin, and Buffalo sites (Hanson 1966, 1975). It has been remarked that the closest structural analogs were to be found in the thirteenth-century Anderson focus Incinerator site (Heilman, n.d., 1975). However, unlike the structures recovered at Killen, all those previously reported Fort Ancient structures were located within concentrated (and probably palisaded) villages.

The various analyses of the five Fort Ancient structures from Killen have

suggested that they were each occupied by from 10 to 12 persons and that the duration of occupation may not have extended much over a single generation. The single prepared interior hearth in each structure has suggested a single economic commensual unit. The limited stylistic variability seen in most of the lithic materials recovered from any structure suggests an extended, possibly patrilocal family, a suggestion congruent with ethnohistoric and linguistic reconstructions by Callender (1962, 1978). The best demographic and social reconstructions of the Killen mortuary population have demonstrated the rather egalitarian nature of burial ceremony and have reaffirmed the coeval interrelationships of Killen-Grimes-Wamsley.

To assemble all of these lines of evidence into a plausible reconstruction has required imputing the demographic, ceremonial, industrial, and subsistence activities missing from the Killen-Grimes tracts to the Wamsley Village. These imputations have been supported by the data recovered from the surface collection and limited test excavations of Wamsley. Still, further archaeological excavations at the Wamsley Village site may alter this reconstruction. Wamsley Village is represented archaeologically by a high density, rapid drop-off area of surface-exposed midden which is concentrated on a rather flat, 150-m-diameter knoll on the second terrace of the downstream point of the Ohio Brush Creek/Ohio River junction. The remainder of the old Wormsley property, where the Conway house stands and which runs for over 400 m to the west along this 200-m-wide terrace, has been disked, plowed, intensively surface collected, and subjected to systematically extensive subsurface excavations and trenching without yielding any Fort Ancient material. To the west of this zone lies the 250-m-long Grimes tract which has yielded discontinuous areas of burning, ephemeral sheet midden, postholes, and little else attributable to a Fort Ancient or Late Woodland occupation. Beyond this, the Killen tract runs 120 m westward to where the first and second terraces are cut by Manyouper Bayou, a seasonally filled channel. Along the Killen tract, five subrectangular structures were spaced about 10 m apart along the second terrace edge for about 80 m to where a low burial mound was built on the point where this second terrace ends. The (probably palisaded) Wamsley Village site itself is thus interpreted to have been a typical year-round Fort Ancient agricultural site wherein the majority of curatorial-industrial activities and most redistribution, processing, and consumption of subsistence resources occurred. It was the location at which the majority of the population lived and performed whatever socioceremonial rituals they performed to keep their gods in their heavens and all well with the world. Whatever activities these Fort Ancient peoples may have performed on the low upstream first

terrace, below their village knoll along Ohio Brush Creek, have been lost to the 1790–1804 villages of Pleasant Bottoms/Squirrel Town; to the 1913 floods; and to the construction of the 1954 Army Corps of Engineers boat ramp. The unoccupied, gently dropping 600 m of terrace from Wamsley Village through the Grimes portions of the second terrace may represent the agricultural fields which supported the population. Ethnohistoric and historic accounts of eighteenth-century-A.D. Shawnee and Miami villages in this region report such fields with beans and squash amidst the corn stretching for miles along the river valleys (Bouquet 1765).

Toward the far end of the agricultural fields, a number of temporary structures or shades were erected for special functions during which, or in conjunction with, rather large areas of burning were associated, although no large amount of food was prepared or consumed. It is argued that some of these represent watch platforms while others were areas where family or work groups of females fired pottery without danger of burning up either village or crops, and where some males performed initial flint knapping. Beyond these activity zones were a series of five structures which appear to have been occupied at various seasons of the year by groups of mixed sexual composition. While some game was butchered and skinned in these areas and while some fish and meat may have been cooked, smoked, or stored here, most of the faunal resources were consumed back in the village. It also appears that while hides may have been initially prepared in the area of these Killen structures, it is unlikely (given the total absence of needles, awls, or beamers) that any degree of final hide preparation or actual sewing took place there. Some amount of secondary flint knapping appears to have taken place, but there is little evidence for any final tool manufacture or for much tool use near these structures. The proximity of these structures to the low burial mound surely suggests that, in addition to domestic functions, these structures could have served some segments of the village for temporary housing during periods of mortuary ritual. They may well have functioned either as lineage segment charnel houses or as postinterment purification residences, both of which are known to have been used by the local historic Indians (see Callendar 1978). On the other hand, however, the Killen houses may simply represent the extramural functional structures (viz., Watanabe 1969) which were associated with the most typical concentrated, palisaded Fort Ancient and/or Monongahela villages of the late prehistoric period in the middle and upper Ohio River drainage basin. Therein lies a problem: this reconstruction of a Fort Ancient settlement is based upon the only extensively excavated nonvillage Fort Ancient site reported in the region (Plate 13).

Plate 13. Artist's reconstruction of Fort Ancient occupation of Killen-Grimes-Wamsley.

Conclusions

It is clear from the ceramic focus or phase (Griffin 1978; Essenpreis 1978) to which the Killen Ridge component may here be attributed, just as it is clear from the available radiocarbon determinations which place the occupation firmly in the period A.D. 1150 to A.D. 1330, that in this region of the Ohio Valley, between the Miami and the Scioto Rivers, there was a gradual development of Fort Ancient ceramics, lithics, and settlement, from the styles of a more Woodland-like Baum or Brush Creek phase, to the styles of the protohistoric Madisonville/Fox Farm phase. Having examined a representative sample of the Killen-Grimes-Wamsley ceramic assemblage, Griffin stated in a letter of June 10, 1980: "While this collection of mangy sherds may not readily be placed in any one of the late 1930's Fort Ancient types, and those types not as clearly defined as they should have been, it is because this assemblage of individual fragments does not easily conform."

Agreeing that some of the Killen ceramics could be considered variants of Fox Farm Cordmarked with some decoration reminiscent of Feurt Incised, Griffin also noted that all of the vessels appeared to have been finished by paddle and anvil, and all were probably constructed by coiling. Further, he argued that the majority of vessels displayed rim attributes which normally should have precluded their being easily assigned to either Baum or Madisonville types. He concluded by expressing the hope that additional components would be located and excavated, "so that a judgment can be made whether this group fits into a projected descendent of the Brush Creek stuff at Serpent Mound" as Brose had proposed.

It should be clear that, in my opinion, such a development never looked like a ceramic assemblage characteristic of Anderson or Feurt (*sensu strictu*).

As pointed out elsewhere (Brose 1976b; Brose and White 1978; Essenpreis 1978; Griffin 1978), an earlier proposed three-area/three-phase developmental system for Ohio Fort Ancient (Prufer and Shane 1970), in light of more recent data, is at best inadequate and at worst inaccurate. The presumption that Fort Ancient appeared at a number of scattered locations within Ohio due to a single Mississippian *Drang nach Osten* still remains unsupportable without the hidden assumption of vast cultural amnesia. Furthermore, recent studies (Murphy 1975; Essenpreis 1978; Brose and White 1978; Graybill 1980) have indicated the contemporaneity of sites attributed to Madisonville and Anderson, Madisonville and Feurt, Feurt and Baum, Baum and Anderson, and Baum and Madisonville "phases." While it is true that some rather Late Woodland–like Baum (or Brush

Creek and/or Baldwin) sites antedate some protohistoric Madisonville (and/or Clover) sites, there is no justification for supposing that all Fort Ancient "phases" were not coeval to some extent in the period between A.D. 1200 and A.D. 1400. If this is correct, then the differences between these "phases" cannot be explained simply as a function of temporal change. Differential exposure to downriver Mississippian centers and to each other remains a reasonable alternative for systematic consideration.

Recently, Essenpreis (1978) has postulated the existence of a differing intersite structural hierarchy between Anderson and Madisonville Fort Ancient sites in Ohio. The Killen-Grimes-Wamsley Fort Ancient occupation could be fitted within that postulated Madisonville system as a third-order agricultural village. The models of Fort Ancient development which Essenpreis developed, and from which her hypothesis of site function was derived, differ in many respects from what I believe to have been the case (Brose 1976b). Yet along with recent discussions by Griffin (1978) and Graybill (1980), both my model and that of Essenpreis, whatever their shortcomings, seem better able to explain new data, such as Killen, than do older models predicated strictly upon invasion and imitation (e.g., Hanson 1965, 1976) or population replacement (Prufer and Shane 1970). This is appropriate, although these new data as yet do not offer evidence which would favor one or another of the more complex scenarios offered by myself, Griffin, Essenpreis, or Graybill. Nor, until such data are made available, will better syntheses be possible.

Large unexcavated portions of many major Fort Ancient villages remain. New sites, albeit of lesser importance, are still being discovered. Major museum collections remain either unanalyzed or have not been restudied in half a century. What I believe is necessary at this point is to systematically think through the problems at hand in order to discover what kinds of answers should be sought from the *existing* data to enable us to formulate models of how Fort Ancient may have developed. In that sense, indeed, further work is needed.

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